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SYMPOSIUM ON PNEUMONIA*

PNEUMONIA.

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The past two winters have been so fraught with tragedy that when one stops to review his activities he is surprised at the magnitude of it, and is at a loss to know how to correlate his labors into a comprehensive story.

The country has been afflicted by a series of epidemics of respiratory infections, concerning which much has been written and published in most all medical periodicals. And, too, there is not a physician practicing medicine in any nook or corner of this country, nor on this globe, who has not had practical experience. Each and every one has formed some original idea and has put into practice some original thoughts. The sum total of which will be the step forward in the management and treatment and prevention of respiratory diseases. It would be out of place at present to endeavor to review the thought so far recorded by the profession, but I will briefly call your attention to the various forms of pneumonia resulting from these various air passage infections.

The first epidemic or wave of infection came in September, 1917. I was then at U. S. Army Base Hospital at Fort Sam Houston, Texas, where I had been assigned to the Medical Service in July. I was put in charge of the first pneumonia ward. All pneumonias admitted and all occurring in the hospital were transferred to my ward. The result was that I was soon in charge of several full wards of pneumonia. These were truly pneumococcic pneumonias, running true to type, beginning with a chill, high temperature, rapid breathing and rapid consolidation of one or more lobes. They were studied from every angle. A routine of culture of sputum and blood, and examination of stools for parasites, blood count and pneumococcic type determination was carried out. So truly typical of lobar pneumonia was this first epidemic that a department order was issued that a diagnosis of pneumonia must not be made unless the soldier had a temperature of at least 102, a respiration of 30, and white blood count of 18,000, and it was usually possible to have all three requirements, the white count often going much higher, unlike the last epidemic, when a pronounced leukopenia prevailed. These patients recovered by crisis with the few exceptions of those slowly resolving conditions and those

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in whom fluid developed. The incidence of empyema in the first epidemic was small, not larger than would be found in the same number of cases in private practice. Endeavor was made to determine the type in each case. Type one and type four predominated. Type two was not uncommon, and type three occasionally occurred. Type one anti-pneumococci serum was used in all type one cases, and there is no doubt that the mortality in patients suffering from that type was much reduced. From the early use of serum, and large doses, the best results are obtained. After desensitizing the patient, 100 c.c. of serum with 100 c.c. of normal salt solution are given in the vein, slowly by gravity, and repeated in six, eight, or twelve hours. The results at times are extremely gratifying. The mortality in this epidemic was about 12 per cent. By clinical observation, laboratory reports, and post mortem findings, these cases were truly pneumococcic lobar pneumonia. Also the small per cent. developing fluid showed a pneumococcic infection, and I think Major Blesh will bear me out in stating that these first cases respond nicely after operation, and the mortality was small.

The second lap of this 1917-18 infection gives us two distinct classes of pneumonia. One is the lobar, which we have just discussed, reinfected with the streptococcus hemolyticus, and the other is the broncho-pneumonia in which the streptococcus hemolyticus was so common that it seems to have been the causative factor. The streptococcus hemolyticus apparently made its advent with the appearance of measles. And there got to be many carriers, healthy and otherwise of that organism, and in that way, and also from cross infection in the ward, we have the second variety of pneumonias in my list, i. e., lobar re-infected with streptococcus hemolyticus. From December 1, 1917, to March 1, 1918, there were admitted 319 cases of primary lobar pneumonia, 44 or about 14 per cent. of these became re-infected with streptococcus hemolyticus. This does not include a certain small group of primary streptococcic infections affecting the chest. These 319 cases of pneumonia were all originally pneumococcic infections proven either by sputum culture, blood culture, lung puncture, or tissue culture at autopsy. Clinically, they looked and acted like lobar pneumonia up to a certain point in the progress of the disease. The streptococcus was grafted upon a lobar pneumonia. It made itself evident in a very short time. Often a pleural exudate, containing streptococcus, occurred in 24 or 48 hours after admission to the hospital. The exudate was a peculiar dirty brownish fluid containing streptococcus. Of the total number of lobar pneumonias occurring between these dates, 97 developed fluid; 22 of these were pneumococcic empyemas, of which 5 died; 33 streptococcic, of which 17 died. One showed both pneumococcic and streptococcic infection and was a fatal case. In 41 cases the fluid was sterile or undetermined, of which number, 9 died; no doubt some of these were streptococcic infections. The high incidence and high mortality of streptococcic infection is at once apparent; the mortality in these re-infected cases was over 60 per cent.

The third group of pneumonias I wish to mention is broncho-pneumonia, following measles. During the winter of 1917-18 we had 618 cases of measles, with 89 pneumonias and a mortality of 47 per cent.; 80 per cent. developing fluid in the chest.

The symptoms usually began within a few days after the onset of measles, or a few days after convalescence from that disease, with a pain in the chest, sore throat, cough, chill, fever, and general malaise. The physical signs are indefinite, but there is usually some vague dulness over the chest and rales are heard scattered widely throughout both lungs, especially at the bases posteriorly. After a few days, dulness is pronounced and usually the exploratory needle reveals the presence of a turbid fluid in the pleural cavity. This accumulates rapidly and re-accumulates with extreme rapidity when removed. This fluid invariably shows the presence of the streptococcus hemolyticus. Other complications than empyema were not uncommon, otitis media, mastoiditis, sinusitis, and generalized infection resulting in furunculosis, arthritis, and meningitis occurred.

The fourth variety of pneumonia is that which has differed from any pneu-

monia with which this generation of doctors has had to deal. I refer to the pandemic of pneumonitis which has invaded the entire world and has been designated Spanish influenza. I cannot give the exact number of cases treated at Base Hospital, Fort Sam Houston, but this I know, that in the latter part of September, 1918, it came like an avalanche filling the entire hospital, and every other available space. Every precaution was taken to prevent cross infection, beds were spaced ten feet apart and separated by sheets; head to foot sleeping was ordered; doctors, nurses, and corps men were gowned and masked and all sanitary precautions taken. Nevertheless, about one in six developed demonstrable physical signs of pneumonia, and it ran so true to type that it led me to believe that a potential pneumonia existed in all cases and that we might not be far wrong when we refer to the epidemic as one of pneumonitis, and that a special cause existed—bacteriological study of nose and throat swabs and culture from the sputum in the recent cases did not reveal the influenza bacillus. Neither was it found in the study of the cases that had fully developed pneumonia. In a very complete record of the bacteriology of one hundred cases of fully developed pneumonia treated in one ward by Capt. Henry J. John, the bacillus of influenza was found in three instances, in culture of sputum once, and in culture of swab from throat, twice.

Bacteriological Data on First 100 Cases Admitted.

	Sputum	%	Throat	%	
Streptococcus Hemolyticus	16	16	15	15	
Micrococcus Catarrhalis	11	11	11	11	
Bacillus Influenza	1	1	1	1	
Pneumococcus:					
Type I	1	1	--	--	
Type II	1	1	--	--	
Type IIa	5	5	--	--	
Type III	2	2	--	--	
Type IV	16	16	--	--	
	Positive	**%**	**Negative**	**%**	
Blood Cultures	7	7	95	--	
	Sterile	**%**	**Organism**	**%**	**Type**
Fluid in Chest (Total No. tapped, 24)	6	25	18	75	Streptococcus hemolyticus 13. 1 Streptococcus viridans. 3—IV —Pneumo- I—III —coccus.
	Sterile	**%**	**Organism**	**%**	**Type**
Lung Punctures:					
Antemortem	7	50	7	50	Streptococcus
Postmortem	2	100	--	--	hemolyticus.
	Sterile	**%**	**Organism**	**%**	**Type**
Heart Punctures: (Postmortem)	2	50	2	50	Streptococcus hemolyticus. IV. Pneumococcus

As per the above chart it would seem that the old organisms with which we had been dealing were the causative organisms, but the clinical manifestation did not bear this out, and it seems that they are implanted upon the field prepared by the specific infection. Whether or not this specific infecting agent is the old influenza bacillus, many investigators are in doubt. Interesting investigations on animals have been carried out by Dr. A. J. Heinkleman, in Wesley Laboratory, Oklahoma City, and reported in the *New York Medical Journal*, April 26, in which he states that he has found a motile bacillus which he believes is a higher organism than the old influenza bacillus, but of the same family, but has changed its morphology by evolution, just as the typhoid bacillus may have evoluted from the colon bacillus. Be this as it may, we are dealing with a specific infection causing a peculiar pneumonia. I agree with Riesmon when he states that to him it appeared that pneumonia was not an accidental complication, but an integral part of the epidemic.

The symptoms of the onset of influenza are too familiar to everyone to need any reference here. The insidiousness of the beginning pneumonia is significant. Any influenza running a temperature unduly long usually does so because of involvement in the lung, and you only have to search to find it, usually in the base of one of the lungs posteriorly and is heard as a fine shower of rales at the end of a deep inspiration. This may last for a few days and the pneumonic spot clear up. And again it may rapidly spread until a great wide area of lung is consolidated, spreading to the other lung, and frequently bubbling rales appearing throughout the whole lung, announcing the fatal pulmonary edema.

The accumulation of fluid in these cases was comparatively small, but the number of slowly resolving pneumonias was comparatively large, and aspiration of these consolidated areas frequently resulted in a dry tap. These were essentially broncho-pneumonias resembling lobar, in that they became massive in their consolidations, and this term describes them best, massive bronchos.

As to treatment, that is a matter of personal preference with one or two exceptions. In the first class mentioned, pneumococcic pneumonias, in type one infection, type one anti-pneumococcic serum properly given is specific. In the measles pneumonia, treatment was very unsatisfactory and was symptomatic. We digitalized our patients, fed them and stimulated them and quieted them with sedatives. In the influenza type our only change from the general accepted ideas was in the use of glucose. We gave 250 c.c. of a 10 per cent. solution intravenously and I am satisfied with good results. The acidosis suggested its use and the results were that, after its administration, several hours of quiet rest ensued, the cyanosis was diminished, the evidence of edema lessened, the heart strengthened and elimination increased. To avoid the chill that sometimes followed, we almost habitually added 1-8 grain morphin to the solution, also if digitalis was indicated we added that; in my opinion this is our one big advance in the treatment of pneumonia. As to empyema there is a selective time to operate. We tried early operation, delayed operation, aspiration, and let-alone policy, with no material difference in results, except that those operated very early died from immediate toxemia and shock. It came to be my personal belief that three of four days' delay gave time for the patient to react and develop some degree of resistance. I am satisfied that I am correct in this.

SURGICAL COMPLICATIONS OF PNEUMONIA WITH SPECIAL REFERENCE TO EMPYEMA.

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GENERAL CONSIDERATIONS:

It has been familiar knowledge for many years that the pneumococcus will give rise to surgical infections of many kinds, in different locations, that no tissue can be said to be exempt from its invasion. What can be said of the pneumococcus with which we are all familiar, may be said with greater force of the streptococcus hemolyticus. These various surgical complications may have to do with any part of the body. Metastatic abscesses have been found in joints, in the abdomen, in the mastoid cells, etc. In this paper we shall deal alone with that complication known as empyema and incidentally with lung abscess.

Of especial interest to us at the present time because of the recent epidemic which had its origin in the base hospitals, and because it is new to us, is the streptococcus hemolyticus. This germ runs true to the streptococcus type, in the character of the pathologic changes to which it gives rise. In its clinical course it is rather sub-acute than acute. Very rarely indeed is it acute. Almost as rarely is it chronic.

The chronic clinical symptoms which have been observed in streptococcus hemolyticus infections are those of empyema, and are due to badly drained abscesses. It is prone, like its cousins, to form matastases. Multiple abscesses are common. When the pleural cavity is infected it more often gives rise to localized abscesses than does the pneumococcic. It is rare to find the pleural cavity one large suppurating cavity, as is so often the case in pneumococcus infection. On account of the tendency to multiple abscess formation the surgery of it is less satisfactory, and presents a higher mortality than does the surgery of pneumococcus empyema. In the beginning of the streptococcus hemolyticus epidemic in the U. S. Army Base Hospital, at Fort Sam Houston, Texas, it was the custom to post-mortem every fatal case. This taught us that the cause of death was the inadequacy of the surgery, that is, there were foci consisting in abscesses about the crux of the diaphragm and other surgically inaccessable localities which had not been tapped. The thoroughness of the post-mortems done at this time at this hospital can be attested because they were done by a detachment from the Rockefeller Institute. One of the characteristic actions of this germ is its hemolytic action upon the red blood cells. It is this hemolysis that causes the profound illness of these patients. This is so striking that it was not a difficult matter in merely walking through the wards to be able to point out those suffering from this infection.

For the reason that Dr. Rucks has gathered and accurately presented the statistics as to mortality in the paper which he has just read, we shall not enter into this aspect of the subject very deeply.

DIAGNOSIS.

Around the question of the elective time for operation has waged a considerable controversy. For that reason, if for no other, the early diagnosis of pleural empyema, whatever its source, becomes very important. In the base hospitals, as in private practice, this was in the beginning often made late, consequently these early cases were submitted late, to surgery. In these the course was not unlike that familiar to us in civil life. The lung was collapsed, and bound down by dense adhesions to the root of its tree. The ribs raftered over an enormous cavity. The lung could not come out to the chest wall, consequently the surgical

indication was to cave the chest wall into the lung. No matter where the simple drainage was placed the cavity would remain and drainage keep up indefinitely. For reasons later to be mentioned in this paper, early diagnosis in this type of infection has a special significance.

In addition to the ordinary diagnostic methods, such as percussion, auscultation, and the exploratory needle, the x-ray not only proved to be an extremely valuable means of early diagnosis, but pointed out the site for drainage as well.

OPERATIVE INDICATIONS.

Aside from a few anatomical conditions the old rule of the early evacuation of pus holds true in suppuration of the pleural cavity, whether as a whole, or in circumscribed abscesses, here as elsewhere.

The fact that the floor of the abscess is yielding and collapsible, and the roof fixed, must be borne in mind in admitting atmospheric pressure in making a drainage opening. An abscess, the walls of which cannot collapse, will not get well. Also if in making an opening to such a cavity, the bottom falls out, i. e., the lung collapses, a new danger, that of spreading the infection over wide uncontaminated areas, must be borne in mind. Also the danger of adhesions fixing the lung in this collapsed position must not be forgotten. The fact that hemolytic infections are sub-acute in their course, and that the abscesses are inclined to be localized, gives us the cue as to the elective time to drain them. That time should be when the visceral pleura has been anchored by the inflammatory process to the parietal so that the lung will not collapse under the forty pounds atmospheric pressure admitted when an opening is made.

All streptococcic adhesions are firm and hard, and leave no line of demarcation, but amount to what is practically a fusion of the tissues involved. In this respect the hemolytic acts as does its cousins. If an abscess is opened before these adhesions are firm enough to resist the atmospheric pressure, and the lung collapses in response thereto, adhesions will immediately begin forming about it which will forever hold it in its collapsed state. For the formation of these protective adhesions to the chest wall we found that from four or five days to a week or ten days was required. This then constituted the time of election for operating the hemolytic cases. The neglect of this point, or rather the failure to comprehend it, gave us both a much higher mortality and morbidity in the early cases than we had in the later.

Just exactly the opposite was found to be true in the pneumococcus infections, that is, the earlier the operation, after pus was detected, the better the result. The reason for this was that though the lung collapsed immediately upon the admission of air to the pleural cavity, it invariably expanded again. Often this could be seen to occur while the patient was on the operating table. If not then, it could be demonstrated that it had occurred within a few days of the operation. Adhesions in this type of inflammation are not so firm, nor extensive nor so early formed, as in the hemolytic type.

I disagree with Dr. Rucks as to the cause of primary mortality, which he attributes to the shock of operation. The operation *per se* under a local anesthetic was absolutely shockless. Lung collapse, however, could, and probably did, contribute to the mortality in the early cases. In the streptococcus cases where death did not immediately follow lung collapse, morbidity was greatly increased, as well as subsequent mortality from prolonged suppuration. As to the time of operation I am in agreement with the writer of the previous paper. This selective time, and the reasons for it I have pointed out above. It is based upon our experience in approximately four hundred cases, operated upon by either Captain Stout, or myself. These cases were placed under the ward care of physicians selected by the Chief of Service, and the opportunities for observation could not be excelled.

To meet this collapse of the lung, due to atmospheric pressure, several types

of operation and several instruments have been devised. This fact remains, however, that the mortality under all has been about the same. There is a difference, however, in the morbidity. The mortality ranged between twenty-five and thirty per cent. As pointed out by Dr. Rucks, the early epidemic which was due to a pneumococcic infection furnished a much lighter mortality. Our surprise came at the high mortality of the second epidemic. This set us studying the causes, and we found it due to a new type of infection—the streptococcus hemolyticus, the clinical course of which we had yet to learn. We soon found that early operation, that is, operation as soon as the fluid showed germs, or pus, would not do in this type as in the former. The proper thing to do in these cases, as indicated above, is to wait a sufficient time for the abscess to localize, and for adhesions to form, but not sufficiently long to encourage metastases. What is true of the hemolytic infections is also true of those following measles.

As to the time of operation, the main fact to remember, in our experience is, that in the pneumococcus type of infection very early operation is indicated. In the hemolytic type it is best to wait till firm adhesions have anchored the visceral to the perietal pleura. In the determination of this time the x-ray picture is invaluable. It is important also to remember that in the hemolytic variety of infection a collapsed lung never again expands. I say, never again, because I never saw one do so. The selective time to operate in the hemolytic type, therefore, is not so much a matter of days, not so much a matter of shock, but is a matter of the time when we know the lung is fixed. In the hemolytic type the infection more often runs to circumscribed abscess formation, in the pneumococcus, more often to true empyema.

THE RELATION OF LUNG ABSCESS TO EMPYEMA AND VICE VERSA.

Is empyema or abscess of the pleura primary, or is it secondary to a primary lung abscess caused by the pneumonic process perforating into the pleura, or involving it by extension? The post-mortems done at the Base Hospital at Fort Sam Houston, throw no especial light upon this question. They demonstrated that pulmonary abscess and pleural abscess, or empyema quite often co-existed. There are those who believe that an interlobular pneumonic abscess is the commonest source of pleural abscess and empyema. We know that empyema and pleural abscess may exist without a demonstrable abscess of the lung, and indeed without the previous existence of a pneumonia. It is rational to believe that either may cause the other, or that either may exist alone. This view coincides exactly with the facts as demonstrated by post-mortems. A lung abscess, small, sub-pleural, may easily extend itself or perforate into the pleural cavity, and thus be the beginning of the pleural process. This is probably more often true than the converse. An abscess of the lung may, or may not, be an extremely serious complication. If it is deeply situated and on this account does not fix the visceral pleura to the perietal it is surgically a grave problem. This is said even in view of the fact that so great an authority as Moynihan considers the lung as surgically accessible as the abdominal viscera. To suddenly deprive the patient of one half of his breathing capacity cannot be considered as without its danger. There can be no question in the writer's mind that it is to the patient's interest at times to take this risk, but it should not be debonairly done. It is true that lung abscesses frequently spontaneously recover by rupture into, and emptying through, a bronchus. No doubt many small abscesses complicating pneumonia are sequestrated, sterilized and absorbed by natural processes. Lung abscesses are rarer without a complicating empyema than the converse. In this statement I have the support of the Chief of the Medical Service as well.

TYPE OF OPERATION.

Based on the work at some of the base hospitals, the closed method of operating has become quite popular of late. The sole reason being to avoid collapse of the lung with its sequellae. This is a desirable thing, provided, in securing it,

first surgical principles are not violated. In any of the methods so far devised it cannot be said that this is true. Drainage is inadequate and not continuous. Practically we find that the mortality in the series of cases reported is not lowered perceptibly. As to morbidity, crippled lung function, I do not believe the last word has yet been said for this method. My reason for this statement is this; if the pleural cavity is not continuously drained there will be times when the positive pressure of the filling abscess will compress the lung. The question of returning lung expansion will then depend altogether upon whether the lung is fixed by adhesions in its compressed position. If a better functional result is not obtained, and the mortality is as high, the open operation, involving rib resection, has such distinct advantages that it should be the operation of choice. In my work, when following the indications for operations outlined above, I am quite sure that the open operation, with incision, and rib resection placed at the bottom of the abscess, giving as it does the best drainage, has proven to be the most satisfactory. In these very ill patients, a general anesthetic of any kind will contribute to the mortality. Ether the most, gas the least, but each will have a distinct mortality of its own. The incision and resection of the rib can be made absolutely without pain under local anesthesia, the patient being prepared, and soothed by a preliminary hypodermic of morphine. I have done the operation without the patient knowing that I was operating at all, the manipulations necessary to the operation being explained under one or another pretext. Psychic shock is an element which must be taken into account.

THE CARREL-DAKIN SOLUTION.

My experience with this has not convinced me that it has contributed materially to the recovery of my patient. In the cases in which drainage was not properly placed it was of value in taking the place to a degree of a proper surgical operation. When the surgery was adequate it did not hasten convalescence. I had as good results from normal salt solution. Upon the whole, my army experience has not made me more a friend of the Carrel-Dakin solution, in surgery. Since this portion of this paper will be attacked, I will reserve further remarks for the closing discussion. Suffice it to say, that when anything goes wrong with the complicated machinery necessary in its use, everything goes to pot immediately, and often disastrously. There is nothing surer than that the Carrel-Dakin solution will never be a substitute for correct surgery, nor an excuse for slovenly surgery.

THE SIMULATED SURGICAL ABDOMEN OF PNEUMONIA.

By the surgical abdomen we mean the typical syndrome associated with inflammation of the peritoneal cavity. This is of more frequent occurrence than we formerly believed. The immense number of cases of pneumonia, with pleural complications gathered together at one time, and in one service, demonstrated this fact. In one thousand cases it approximated five per cent. In several cases the abdomen was so characteristic, and the lung findings so negative, that an immediate operation was performed for ruptured appendix, only to find the appendix normal and a condition of intestinal paresis. The clinical picture of these cases was typical, in that the temperature would range from 103 to 105, there would be pulse acceleration, and of course, leukocytosis. The abdomen would be excessively hard, and very painful to pressure. The pain was so great that one quarter of a grain of morphine would have no effect upon it. In many of the cases the lung findings would be absolutely negative in the beginning. The urgency of the abdominal symptoms made immediate operation seem imperative. Mistakes were made, of course. Experience made us later very cautious.

In analyzing the symptoms, after having had the experience, it seems relatively easy to make the differentiation. It can usually be done on the following facts: 1. Excessive elevation of the temperature; 103 to 105 is not an abdominal temperature but is typically a lung temperature. Experienced surgeons know that a temperature of 103 and over is rarely found in abdominal surgical conditions.

2. The leukocyte count. This is always too high for a beginning inflammatory condition in the abdomen. To have a leukocyte count running from fifteen to thirty thousand would designate suppuration, if it had to do with the abdomen. Just as is the case with the temperature, this is also typical of pneumonia. 3. Pain. This is out of all proportion. Pain having its origin in a peritoneal inflammatory lesion is usually relieved with one-quarter grain of morphine. I have never seen this pain, when due to pneumonia, relieved by this dose.

By carefully considering the above three points we finally became able clinically to eliminate most of these cases of simulated peritonitis. Within twenty-four hours as a rule, the pneumonia would become frank. Probably what happened here was a central diaphragmatic pneumonia, the inflammation touching the peritoneum of the attic of the belly, and thus setting adrift the whole peritoneal syndrome, because wherever an inflammatory process touches the perietal peritoneum the muscular reflex is immediately excited. Even with the experience we have had, none of us are as yet sure that we are able always to differentiate sufficiently to postpone operation in what seems to be a terrific abdominal catastrophe. I would yet say when in doubt, open the abdomen, for I know of no case in which this was done, under mistaken diagnosis where life was lost because of the operation.

THE ETIOLOGY AND PATHOLOGY OF THE SPANISH INFLUENZA.

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When we approach the subject of the etiology and pathology of the "Spanish influenza," commonly known as the "Flu," we are met with a voluminous literature by a multitude of authors, for there has never been a disease that has been attacked by such a large number of trained men armed with such complete facilities for the study of a condition in all of its phases as has been the case with the pandemic that spread over the world in 1917-19. And yet one cannot pursue his studies far by the conflicting, not to say opposing, conclusions of the many, many workers who have attacked this problem. In fact, scarcely any two of them agree in general, let alone in particular, either as to the etiology or the pathology. Part of this disagreement is due to the fact that many men rushed into print early when they had either not made sufficient observations, or were inexperienced in such matters so that there was soon a considerable literature on the subject, and later investigators, many of them, spent their time in either proving or disproving the contentions of these early observers.

Another fact that appears to me to have added to the confusion, is the fact that, as is always the case, when an epidemic is raging there are many similar conditions that are called the same thing. Or in other words, there were many cases of disease that were called "Flu," because of the similarity of some of the symptoms, that were really not the entity that gave the name to the epidemic.

The consideration of all of the cases as "Flu" has necessarily given a complexity to the reports. One man reports that the characteristic pathological finding was emphysema, another says, "in 50 autopsies I saw no emphysema." Some men say that the pathology was an extensive bronchopneumonia, while other studies show that the bronchi are open and that what might be called areas of exudation are in reality infarcts. So we are forced to the conclusion that either the "Flu" is met with in many forms, or that in reality, instead of having a pandemic of a single disease entity, there were many epidemics of respiratory tract involvement that occurred at the same time. So that it is very possible that in one section of the country there was an epidemic of bronchopneumonia with a few cases of "Flu"; in another section there was an epidemic of "Flu" with a good sprinkling of bronchopneumonia; and in another there was an epidemic of pernicious bronchitis with a

few cases of "Flu" and bronchopneumonia. If this is true, and it is not only possible but highly probable, it is easy to see why careful observers and students would disagree in their findings and yet all be equally right, except in calling the cases "Flu." From my own studies, I am convinced that the general run of cases that were met during the pandemic, were in few cases what could be called uncomplicated "Flu." And in looking over the report of at least one observer it would seem that there were about ten cases out of a series of over fifty that could be so considered. They were often a true pneumonia superimposed on a "Flu," or "Flu" on pneumonia, or on bronchitis. But it also seems to me that the characteristic "Flu" pathology is distinctive enough that it can be detected even in these complicated cases.

Keeping these facts in mind, non-"Flu" cases called "Flu," complicated "Flu" and pneumonia, or bronchitis and "Flu" or bronchitis alone all called "Flu," we can review the reports of the various observers with more confidence and sympathy. But at the same time, if one wishes to discuss intelligently the etiology and pathology of the "Flu," he must have a series of autopsies in which the pathology corresponds, and the bacteriological studies also agree. Then if he can take these bacteria or organisms and produce the same pathology as occurred in the original case, he will be in a position to speak with authority on the etiology and pathology of the disease. But where one has a series of cases in which the bacteriological studies gives "n" per cent. of one bacillus and "m" per cent. of another bacillus and "x" per cent. of still a third, if he cannot divide the autopsy findings so as to say, so and so are the findings when "n" bacillus is in pure or almost pure culture, and such and such are the findings when "m" bacillus are in the ascendancy, he is in a poor position to speak with much exactness. And this latter is the case with two exceptions with the present reports. They all report a variety of bacteria in each case and a variety of autopsy findings without correlating the two studies and without satisfying the biological postulates. Unfortunately for the purposes of this discussion so far as I am concerned I have not had the time nor opportunity to make bacteriological studies from "Flu" cases so that what I say in that regard will be my conclusions from the reports of competent observers in other parts of the country. And I will say that we are now in a position to really begin a study of the etiology rather than to close the discussion.

It may be asked, why should we have such a variety of epidemics involving the respiratory tract at the same time, if it is true that so many of the cases called "Flu" were either not "Flu" or were complicated "Flu"? The answer to this question gives one of the etiological factors of the pandemic if not of the "Flu" itself, for it must be remembered that the infecting agent is only one of the etiological factors in any infectious disease.

Therefore, we must consider the general conditions that prevailed throughout the world at the time the epidemic started and raged. It will be remembered that a large part of the population were living under suddenly altered conditions of life, in camps, training schools, or districts, or in some form of service, or for other reason in an unusual geographical location. And it was among such camps or groups that the disease first made its appearance in any community where there was such a camp. It will also be remembered that the whole population were living on an altered diet, in many cases and in many ways an insufficient diet. These conditions always predispose to infection. It will also be remembered that during the period from 1917 to 1919 the meteorological conditions were unusual, that throughout almost the entire world there was an unusual amount of moisture in the air and an unusually low temperature prevailing, so there were an unusual number of summer colds even before the "Flu" began. These meteorological conditions are themselves predisposing or favorable to respiratory tract infections. Thus we have a population predisposed to infection and an environmental condition favorable to respiratory tract affliction so there was a fertile field and a determining factor as to what the crop would be.

If we turn from the subjects of infection to the infecting agent, our answer is not so plain. That the "Flu" is an infectious disease no one will question. But as to the nature of the infection we have many answers, more or less conflicting, and all more or less unsatisfactory.

Japanese observers made extensive bacteriological studies in the Kitasato Institute, from "Flu" cases and they reach the conclusion that the "Flu" is caused by the bacillus influenza, although they admit that in almost all cases there were also found pneumococci and streptococci. Haasteen at the Ulleval Hospital, Christiana, Norway, reports that in the cases studied by him, bacillus influenza was rarely found but streptococci were very common. Munro, in England, examined 150 "Flu" sputums by smear and culture and in about half of them he found a short gram-negative bacillus: but he adds, "there was never wanting plenty of gram-positive diplococci and streptococci, and micrococcus catarrhalis." His conclusions are that the "Flu" is started by bacillus influenza and that pneumococci and streptococci are responsible for the pulmonary conditions. A summary of the bacteriological studies made in this country would agree with this decision with possibly one exception. Wolbach, of Boston, and Goodpasture, of Charleston, conclude that bacillus influenza is responsible for the uncomplicated "Flu," admitting that the picture is almost always confused by the invasion of pneumococci and streptococci. The Italian observers succeeded in isolating a very small streptococcus, called by them, "streptococcus pandemicus." They were able to produce "Flu" symptoms in guinea pigs inoculated on the nasal musosa, with these organisms. They also found that animals died when inoculated with cultures passed through a Chamberland filter, also with cultures that had been heated for an hour to 55 degrees centigrade. This would kill the vegetative forms but would not kill the toxin. These experiments would tend to prove what the symptoms indicate, that part of pathological effects or conditions of the disease is produced by toxins.

Early in the discussion of the etiology of the "Flu" it was suggested by many that the real etiological factor or rather the infective factor was a virus, meaning one of the ultramicroscopic organisms, and would class it with the cause of measles, typhus fever and other diseases for which the exact etiological organism has not been found. The experiments of the Italian investigators above referred to would seem to answer this question, at least that the organism was a very minute one and might easily be overlooked by any observer. Right along this same line, Gibson, Bowman, and Conner in England grew a minute filterable micrococcus from filtered sputum and lung tissue of "Flu" cases and also from the kidneys of infected animals. They also produced typical "Flu" lesions in animals inoculated with these organisms and recovered the organisms from the animals. This organism is probably the same as the streptococcus pandemicus of the Italian observers and is an organism that might easily have been included in the cultures of other workers and be responsible for the results they obtained. And while these results require further study and confirmation, they come nearest to answering the question as to the infecting agent of the "Flu" for the reason that in the reports of all of the other observers there is such a catalogue of bacteria listed that we must come to the conclusion that either the specific organism has not yet been found, or that there is no one disease that can be called the "Flu," but rather that the condition that has been called by that name is in reality a mixture of conditions, caused by a variety of organisms acting at the same time.

If we turn from the etiology to the pathology of the "Flu," we find not much more agreement among the pathologists as to the changes that take place than we find among the bacteriologists as to the organisms causing the changes. As was said before, this is, to my mind, because there have been a great many pneumonias and bronchitises that have been called "Flu." And it is impossible to separate the "Flu" from the non-"Flu" cases until we have established the fact that there is a true "Flu" and just what is its pathology.

Personally, I believe that we are justified in saying that there is a condition

that is so unlike the pneumonias and bronchitises or mixtures of these as we ordinarily meet them, that we must consider it a different disease entity even if it proves to be caused by the same organisms. I base this belief on the autopsies that I have studied during the past year. And I shall limit my discussion to the characteristic changes on which I base this belief for the time will not permit me to go far into detail with all of the changes found. I shall further consider the subject of the pathology of the "Flu" under two heads: first, the pathology of the fatal cases, and second, the pathology of the cases that recover. And I will take them up in the order named.

In the first place, the "Flu" cadaver is markedly cyanosed, especially about the head and neck. This is so marked and to a degree that frequently it cannot be obscured by the colored injections of the undertaker. This condition is noticeable in the living and clinicians have remarked that it will not yield to any means now known for relieving this condition, even the administration of oxygen. Why this condition should occur will be brought out later.

When the thorax is opened there is usually found more or less fluid in the cavity. Sometimes this is scant and sometimes it is enough to cause atelectasis of the unconsolidated portions of the lung. There is extensive lung involvement. This may be confined to one side or involve both lungs, and is usually more pronounced in parts of the lobes, and but rarely involves all of the lobes. Even in the most involved lobes there are usually air containing areas, especially along the anterior margin, rarely scattered about as would be the case of confluent bronchopneumonia. The involved areas are markedly congested, dark reddish in color, and usually there are areas of smaller or larger size outlined by grayish lines. Some of these are almost microscopic in size while others are several centimeters in diameter. There are numerous ecchymoses in the visceral pleura, even on the air containing regions. When cut, fluid runs out of the interior of the lung. This is sometimes blood stained and sometimes almost clear. The bronchi contain more or less frothy material, rarely pustulous liquid. The roentgenologist at St. Anthony's Hospital injected several "Flu" lungs through the bronchi and took roentgenographs of them, and anyone would be astonished to see how free the bronchi were. Even the smallest twigs are plainly visible, showing that they were open at the time of death.

The pathological changes in the other organs of the body were similar to the changes met with in death from other infectious fevers. That is, there was nothing unusual that distinguishes the "Flu" kidney or the "Flu" liver from those organs in other diseases of similar nature. The lymph nodes were swollen as was the spleen. The kidneys showed acute tubular nephritis, and there was little change in the heart. So that the lesions that are typical of the "Flu" are largely confined to the lungs. That is, so far as the gross findings are concerned.

A microscopical study of the involved areas of the lung showed a double picture. In general the alveoli were filled with a hemorrhagic or a sero-hemorrhagic exudate instead of the white cell exudate of pneumonias. The bronchi were for the most part open or contained a small amount of cellular exudate, the epithelium being little if any changed, except in certain localities there was a more or less dense cellular infiltration of the bronchi and a cellular exudate in the lumen. In the areas above referred to as outlined by grayish lines, there was a dense infiltration of endothelial cells and polymorphonuclear leukocytes. These areas did not correspond always to lobules of the lung, or to areas supplied by a single bronchus, and the condition of the bronchi in these fields seemed to be secondary to the alveolar condition. Another thing that was common and striking was the condition of the smaller blood vessels. They were filled with thrombi. So that it would appear that the denser areas of cellular infiltraiton were infarcts rather than lobules consolidated by exudate as is the case in bronchopneumonia, and explains the gray outlines of these areas seen in the gross.

I want to emphasize the blood vessel conditions of the lungs, for right here is seems to me is the characteristic pathological change in true "Flu." The

characteristic exudate of the "Flu" is hemorrhagic. There are numerous ecchymoses of the pleura. There are frequent thrombi in the smaller blood vessels. A hemorrhagic exudate means an increased permeability of the vessel walls, also this is one of the causes of excessive edema. Thrombosis indicates injury to the intima of the vessel walls. And the consequent interference to the circulation due to the thrombosis would account for the unyielding cyanosis that is characteristic of the "Flu." Also the infarction of the lungs would account for the frequency of lung abscesses and empyema in those cases that survive the first acute stages of the disease. So that it appears to me that it is the vascular system, not the parenchyma of the lungs, in which the typical lesions of the "Flu" occur and that instead of dealing essentially with a pneumonia as we ordinarily speak of it, we are dealing with a pulmonary phlebitis. Dr. W. W. Lyon, of Washington, is the only other observer whose report I have seen who emphasizes the blood vessel condition and he suggests the name Hemorrhagic Pulmonitis instead of influenza as more descriptive of the conditions found.

To summarize, the true "Flu" differs from lobar pneumonia in that it is rare to find a whole lobe involved, in the numerous ecchymoses, in the character of the exudate, and in the extensive thrombosis. It differs from bronchopneumonia, even of the confluent type, in the extent of the area involved, in the nature and location of the air filled areas, in the character of the exudate, and in the thrombosis and infarcation. It differs from extensive pernicious bronchitis in the freedom of the bronchi, in the lack of extensive bronchiectasis and emphysema and in the points above named for the other ordinary lung involvements. Personally, I did not find a single bronchiectasis as spoken of by some others as being so common, nor did the x-ray studies above mentioned reveal any. And I agree with Lyon in that I did not find emphysema, either interstitial or parenchymatous, except in the air filled areas. This condition is emphasized by some as one of the characteristic lesions.

As to the pathology of those who survive and apparently recover from the "Flu," there are several conditions that are met with. It frequently happens that patients are left with heart trouble of the nature of asthenia, which indicates that there are changes such as cloudy swelling of the heart, although I did not find this condition in the hearts of the patients who died in the acute stages of the disease. Another set of pathological conditions are in the nervous system. These vary all the way from impaired memory and mental acuity to various forms of insanity. But the exact nature of the changes back of these symptoms can only be determined from autopsies a few years hence in known cases of "Flu." As a boy during the epidemic of 1889-90, I was struck by the various cases of spastic paralysis of parts of the body, and by reported softening of the brain in my neighbors, following an attack of the then called Russian influenza.

CONCLUSIONS:

1. There is a separate disease entity commonly called the Spanish influenza, but is more properly a hemorrhagic pulmonitis or a pulmonary phlebitis.

2. The infective etiological factor is most probably a very minute or ultramicroscopic organism, possibly streptococcus pandemicus or the filterable micrococcus of the English investigators.

3. The characteristic lesions are in the vascular system of the lungs rather than in the parenchyma of those organs and the picture seen at autopsy can best be explained on this basis.

Discussion.

Dr. F. M. Sanger, Oklahoma City: As has already been said, the past winter and past fall at times it looked as if fully one-third of the people with whom we had to deal were affected more or less with this influenza, or as I sometimes think, the grippe. I know where I was one-third, thirty-five per cent. of the cases—thirty-five per cent. of the nurses were brought down with it and about

thirty-eight per cent. of the corpsmen, not to say anything of the others that were brought into the hospital. Doctor Blesh spoke of this as being a pneumonic infection and of the different kinds of infection we have in the pneumococcus and streptococcus.

I wish to speak particularly on one or two points he spoke of there as to the operative condition, and at first as to the time to operate.

We know some of the text-books have told us before, and even those that were written during this war, that the sooner we operate for empyema with all cases, the better it is.

As has been brought out in the remarks and addresses, in the pneumonic type if you will operate early it is the better. We found out that we didn't always get these cases as early from the medical ward as we wanted to. They were diagnosed and we advocated the early operation of these cases, but sometimes the chief of the medical service wanted to delay for two, three, four and five days—even until the patients, one or two, at least, became so moribund that it seemed an operation was beyond any benefit to them. I wish to say this: That all of the cases we had, something near ninety-nine of those empyema cases, I believe every one of them would have died if they had not been operated on. That is my conviction, and we had them when they seemed so far gone, or rather were so weak, that they would not be able to undergo any shock or any pain or any effects of an operation at all, and, as Doctor Blesh said, in so many of these cases when the lung was collapsed after operation it would expand again. I have seen that lung before I got through with the operation, begin to expand, before I would get the patient off of the table he would say that he felt better, and nearly always could breathe better and often within an hour would be able to smile at you. Now, gentlemen, when we see these conditions, when we see how, after repeated aspirations, the patient will not improve, we must confess that the open operation is a remedy for this condition. I know that at one time I got from my commanding officer, Major Chidester, who was Chief Surgeon at the Letterman General Hospital in San Francisco, instructions to use the aspiration instead of the open operation, but when he saw the result of this open operation he was convinced that in favor of the open operation.

Now, Doctor Blesh spoke of the multiple infections of the streptococcus hemolyticus. I believe in the army—in fact, I know—we had a better and clearer chance of observing these cases from the inception to the very end than we had anywhere else, unless it is in big ward hospitals or municipal hospitals; and even there we do not get them as much as we do in the army, because in the army when a man becomes ill we tell him what he must do and he does it. He stays there until we get ready to dismiss him, makes no difference whether he is an officer or a private.

Now, in many of these cases we noticed the abscess in the lung; that is, in the streptococcus hemolyticus. Many of them we had to open up. I remember one case in particular, a young man who was gassed in France. He was in the hospital several weeks in Paris and, it seems, he did not improve. He was sent over to the United States and kept in one of the hospitals in the east for about three weeks and was finally sent to the hospital where we were. He was able to be up and since his sister was living in San Francisco he was sent to us. X-ray showed abscess in lung. We operated him, and he made an uneventful recovery. This is only one of many that I might cite.

Doctor Blesh said that in these serious cases in going through a ward you could tell those who are going to get well. Gentlemen, those of you who have been through these wards—the pneumonia and influenza wards—especially when you have been O. D., if you didn't get down with the grippe or something else, you had a pretty strong heart. As the doctor said, you could pick them out. I believe we can prognosticate those who are going to get well and those who are going to die. I remember in more than one instance in the influenza wards that I told the surgeon

in charge or the chief of the service, "That man will not get well." I hated to say it; but it looked like those of us who went through those conditions could look at the patients and say whether they would get well or no. I remember very particularly one man that later developed empyema and we operated on him and he lingered for two weeks and then died, and I told the ward surgeon when I first saw him that it was a fatal case. He was one of four. We operated on him and he was one of those who did not get well.

The Symposium on Pneumonia was also briefly discussed by Dr. R. I. Allen, Nowata; Dr. Livermore, Chickasha; Dr. Goodman, Kansas City; Dr. Ross Grosshart, Tulsa.

Dr. W. W. Rucks, closing: I have been very much interested in the discussion of these papers. There are one or two things to which I wish to refer in closing. One is the quinine treatment. I know it was used quite extensively in Camp Travis, and has many strong adherents. At Fort Sam Houston our results with it were not so good and we discontinued its use. We also used the convalesence serum. We used the serum of recovered patients, taking the blood as soon after recovery as we thought it was safe to do. A Wassermann was made of each donor, and then the serum pooled and the Wassermann re-action of the pooled serum taken. This we used quite freely, with apparently good results. The objection to it is that the blood of the donor and the recipient were not typed, and therefore there was danger of hemolysing the blood of the recipient.

Dr. White referred to the fact that you should not use glucose in less than five per cent. solution. That is quite true. Less than five per cent. produced hemolysis. It is safe to use a twenty-five per cent. solution. Our habit was to use a ten per cent. solution, given in doses of 250 c.c.

Dr. Turley's paper quite coincides with the pathological findings of Fort Sam Houston, and I think also with the clinical manifestations.

In the last epidemic, when you consider the great number of people who suffered from it, the percentage of mortality was not so great. The mortality in bronchial pneumonia, following measles, was much larger.

Dr. A. L. Blesh, closing: There are only two or three points in the discussion of this paper that I wish to dwell upon for a few moments. One speaker called attention to the fact that I could have gone farther in my remarks upon the abdominal types of pneumonia and with this I agree. The point that I wish to bring out is this; that in my opinion wherever we find the abdominal inflammatory syndrome there is inflammatory contact with the parietal peritoneum; that it is a reflex due to a local diaphragmatic peritonitis which in no manner differs from the syndrome of any peritonitis, except in the degree of its intensity. The upper abdominal zone seems to be far more sensitive to irritation than is the lower, and it therefore responds by a more intense muscle reflex. In a few instances supradiaphragmatic abscesses followed in these cases still further supporting the view mentioned above.

Another fact to which Dr. White called attention still further confuses the diagnosis in this class of cases; that is the presence of a co-existing appendicitis. Such cases do exist and when they do the diagnosis is indeed very confusing. The only safe course is, when in doubt open the abdomen. In looking over the past I have some vain regrets where I did not do this because some of those patients are dead. None are dead where I did it.

Relative to the streptococcus hemolyticus, I mentioned in my paper that these patients are very sick from the beginning. This is due to the tendency to early acidosis which is always present. This germ is very appropriately named hemolyticus.

The glucose treatment, as pointed out by Dr. Rucks, is extremely valuable in combating this tendency. It is the hemolytic action of this germ upon the

blood that leads to this pronounced and early acidosis. This acidosis is the cause of early death in practically all of these cases. Acidosis can only be truly antidoted by rest-producing sleep. These patients have a tendency to sleeplessness from the start. Unfortunately we have no drug that will produce this acidosis-preventing sleep. Morphine is the nearest approach to it but even it, to a degree, increases this tendency. The glucose mixture used intravenously is a geat help and therein exists its value.

Dr. Turley, closing: The remarks of Doctor Goodman illustrates what seems to me to have clouded the whole subject of the etiology of the "Flu." He says that at the hospital in which he was serving they made cultures from the naso-pharynx of every case of "Flu." To my mind, the study of the bacteriology of the naso-pharynx in a case of lung involvement is about as valuable as the study of the bacteriology of the back of the mouth to determine the specific bacillus causing a case of appendicitis. It is necessary to study the bacteriology of the lesions themselves.

SOME OF THE SEQUELAE OF EPIDEMIC INFLUENZA.*

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The suggestions submitted, today, are based on a series of 1037 cases, of the "flu," treated and seen during the present epidemic, and 274 cases seen lately, in which sequelae have developed following an attack of the "flu."

Full laboratory data, careful and painstaking examination and the results obtained, in the treatment of these cases by the form of sero-therapy used, have convinced the author that we have had a mixed infection epidemic.

With but two cases of the "flu" developing after 1182 prophylactic doses (of the mixed infection phylacogen combined with the pneumonia phylacogen or the influenza serobacterin combined with the pneumonia serobacterin) had been given and these two cases, of a very mild nature and without complications, makes the author feel that his mixed infection epidemic was of a very definite nature.

The "flu" bacillus, pneumococcus, staphylococcus, streptococcus hemolyticus and viridans, as well as other micro-organisms, were found more or less constantly.

We found that the streptococcus was the predominant micro-organism, particularly in all cases of a serious nature, or those cases having serious complications.

The treatment of this number of cases of the "flu," and those cases developing sequelae following an attack of the "flu," convinces me that all persons contracting the "flu" had a lowered resistance, from some cause, even if they were in apparently good health.

Where there had not been loss of sleep, chilling, exhaustion, insufficient or irrational feeding, etc., *there was a definite history of a chronic focal infection, as a predisposing cause, in all cases.*

There was not one serious case of the "flu," or a case with serious complications, which came under the author's observation but what had a definite history of a chronic focal infection.

An attack of the "flu" being superimposed upon a serious chronic focal infection frequently, if not always, was responsible for the serious complications as well as the fatal terminations.

Diseased tonsils, teeth, sinuses, antrums, and prostates were the principal chronic focal infections observed in this series of cases.

In the series of 274 cases, seen lately, in which sequelae have developed fol-

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lowing an attack of the "flu," we have been able in each case to demonstrate a definite foci of infection.

In our series of 274 cases of sequelae, we have found that the ages most affected were between 20 and 45 years, though we had one case nine years and one 68 years old.

While men were more often affected than women, yet we found that nearly all the cases of involvement of the nervous system were in women.

We had 74 cases involvement of the heart; 22 cases involvement of respiratory tract; 2 cases involvement of brain; 28 cases involvement of frontal sinus; 2 cases involvement of ethmoidal sinus; 12 cases involvement of antrum; 87 cases involvement of nervous system; 21 cases involvement of kidneys; 4 cases involvement of long bones; 8 cases involvement of bladder; 9 cases involvement of prostate; 5 cases of exacerbation of chronic discharging ears.

We found in the 74 cases of heart involvement, that we had four varieties. Either a toxic weakening of the heart muscle; an involvement of the valves; a cardio-nephritic involvement, with a high per cent. of albumin and definite edema, or a vasomotor depression.

Palpitation, shortness of breath, easily tiring after ordinary exertion and asthmatic breathing, accompanied by annoying cough, with or without expectoration, usually brought this class of patients to the doctor for relief.

The removal of the chronic foci of infection cleared up all the heart cases, except one in which there was permanently damaged tissues. In this case, there was an improvement but not entire relief.

In the 22 cases of respiratory tract involvement, we found either pulmonary congestion (due to cardio-vascular or vasomotor paralysis, partial if not total), delayed resolution, empyema (with or without bronchial connection), some pus pockets not in contact with the chest wall, apparent flaring up of symptoms of clinical tuberculosis and annoying irritation of the bronchi.

In all of these respiratory tract cases, the x-ray findings were indefinite and in only one case, of those simulating a tubercular infection, were we able to demonstrate t.b., but, in all these cases, we did find the streptococcus and the staphylococcus.

The removal of the chronic foci of infection, in these respiratory tract cases, gave relief from all the symptoms.

In the two cases of brain involvement, one was apparently the so-called epidemic lethargica encephalitis while the other was a meningeal type (associated with clinical pyelitis).

In the 28 cases of frontal sinus involvement, we had a persistent, obstinate and annoying train of symptoms but in only two cases did we have any difficulty in relieving the condition, after the chronic foci of infection had been removed.

In the two cases of ethmoidal sinus involvement, we were very fortunate in finding the chronic foci of infection, and the removal of these foci gave relief.

In the 87 cases of nervous system involvement, we had a regular three-ring circus type of symptoms and conditions.

From congested fundus oculi, vertigo, lack of co-ordination, mild type of paralysis of one side, arm and leg to the so-called neurasthenia train of symptoms, confusional pyschoses and acute mania of the depressional form.

It was certainly very gratifying to see the improvement that followed the removal of the chronic foci of infection, in this class of cases.

We were very much impressed with the severe constitutional symptoms which accompanied the twelve cases of antrum involvement, as they were unusually severe for antrum infections.

Besides removing the chronic foci of infection, in some of these antrum cases, it was necessary to institute thorough drainage before much relief was obtained.

Clearing up the five cases of exacerbation of chronic discharging ears was accomplished by the removal of the chronic foci of infection.

In the 21 cases of kidney involvement, we had a condition of general congestion as well as streptococcus infections, of all types. One very interesting case, in this series, had both a streptococcus and staphylococcus infection.

The improvement, after the removal of chronic foci of infection, in this class of cases, was more tardy in appearing than in the other types of cases seen.

The four cases of long bone involvement were severe, aggravated, and all had a grave systemic disturbance. In one case, the entire shaft of the bone was involved and an amputation was necessary.

Drainage, in two cases, in addition to the removal of the chronic foci, was necessary for clearing up the condition.

In the eight cases of bladder involvement, we had acute cystitis, involvement of the cut-off muscle or retention of the urine as the reasons for this class of patients coming to the doctor.

Irrigation, in addition to the removal of the chronic foci, in some of these cases, cleared up the condition.

The nine cases of prostate involvement usually complained about a sudden onset, congestion, pain in the back, a feeling of fullness in the thighs which radiated down the limbs.

Staphylococcus aureus, as well as streptococcus, infection was found predominating in this class of cases.

Removal of the chronic foci, followed by massage after the acute stage had subsided, and the use of the sero-bacterins cleared up these cases.

The investigation and the results obtained, in this series of cases of sequelae of epidemic influenza, has certainly been gratifying and interesting to the author and we feel that finding and removing the chronic foci of infection is the paramount consideration in the treatment of these cases.

INFLUENZA AND PREGNANCY.

Fernando Calderon, Manila, P. I. (*Journal A. M. A.*, Sept. 27, 1919), describes the effects of influenzal epidemics on pregnancy. In two cases, quinin was considered also a cause, together with the influenza, for the interruption of pregnancy. In twenty-seven other cases, however, in which influenza was considered a complication, quinin was not given and so could not be considered responsible. Abortions occurred in seven cases in which the influenza was complicated by bronchial or lobar pneumonia. He asks, as a question of scientific interest, "Is pregnancy interrupted by the cough and asphyxia that are usually associated with the disease, or does the toxin of the Pfieffer bacillus act as an ecbolic? The fact that coughing and asphyxia were not prominent symptoms in some of the cases tempts me strongly to believe that the toxin acts directly on the uterus. Its selective action on this organ is further supported by the early appearance of menstruation when the women contracted the disease." Calderon summarizes his observations as follows: "1. Influenza exerted a pernicious influence on pregnancy. This pernicious influence was direct and independent of the broncho-pneumonia and lobar pneumonia complicating the disease. 2. Influenza caused untimely appearance of menstruation. 3. Lobar pneumonia complicating influenza was responsible for the high mortality of this ordinarily benign disease in pregnancy. 4. Bronchopneumonia produced by influenza caused 100 per cent. mortality when it occurred in the course of the puerperium. 5. Influenza caused a deleterious effect on the product of conception."

PREVENTION OF INFLUENZA AND ALLIED DISEASES.*

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Influenza is a communicable disease of serious import and of more serious sequence. It has been epidemic and pandemic at periods down through the centuries. At each outbreak the toll in deaths has been large. It is classed among the most dangerous of communicable diseases.

The pandemic of influenza during the year 1918 cost the world approximately two million lives. The sequelae of influenza will, conservatively speaking, involve five million more.

A disease which causes such direful results certainly demands the earnest attention of both the medical profession and the laity. It shall be my endeavor in this paper to set forth the salient principles governing the prevention of influenza and allied diseases.

Diseases of the respiratory system are common the world over, where crowded conditions prevail or unsanitary conditions exist. In South Africa, diseases of the respiratory tract are common. On the Rand, prevalence of these infections is aggravated by the dry, dusty climate and rapid changes of temperature. In the tenements of cities, crowded conditions, poor food, low resistance of individuals tend to cause rapid spread of communicable diseases. The crowded conditions in military camps together with the many carriers furnish potent sources for the spread of infections of the respiratory tract.

As Chief Surgeon for a number of large industrial concerns in Western Pennsylvania for ten years, my various duties brought me in contact with the serious problems of communicable diseases of the respiratory tract. In addition, my researches into bacteriological and pathological conditions of typhoid, pneumonia, and tuberculosis have proven invaluable. My work in diagnosis and internal medicine of recent years has enabled me to attack the problem of prevention of respiratory disease with a certain degree of accuracy.

During the epidemic of influenza, in 1918, I had the unusual opportunity of observing preventive measures used in municipalities and in army camps. The far more important and far reaching work has been that of pursuing my own methods in private practice. From the beginning to the end of the epidemic vaccines were used. At first, only the smaller dosage was used, as follows:

Four Syringes	A	B	D	C	
Bacillus Influenza	12.5	25	50	100	million per mil.
Staphylococcus aureus	50	100	200	400	million per mil.
Staphylococcus albus	50	100	200	400	million per mil.
Streptococcus	12.5	25	50	100	million per mil.
Pneumococcus	12.5	25	50	100	million per mil.
B. Friedlander	12.5	25	50	100	million per mil.
M. Catarrhalis (group)	12.5	25	50	100	million per mil.

Later the larger dosage, as suggested by Hitchens, was used as follows:

	A	B	C	D
B. influenza	125	250	500	1000 million
Staphylococcus aureus	125	250	500	1000 million
Staphylococcus albus	125	250	500	1000 million
Streptococcus	125	250	500	1000 million
Pneumococcus	125	250	500	1000 million
B. Friedlander	125	250	500	1000 million
M. catarrhalis (group)	125	250	500	1000 million

When a bacteria appeared to be predominating or to have hemolytic character-

*Read in Section on General Medicine, Annual State Meeting, Muskogee, May, 1919.

istics, a therapeutic dose sufficient to overcome that advantage was used. Compound vaccines were used as preventive and curative measures with most excellent results. The results were so entirely satisfactory that my confreres adopted these measures and have reported results that give conclusive evidence of the effectiveness of properly selected and prepared vaccines.

I shall digress further in the field of therapeutics in answer to the advocate of autogenous vaccines to say that often before the vaccine can be prepared the patient is dead. Therefore, the *standardized stock vaccine, in acute infections of the respiratory tract, will be the potent therapeutic measure of the future.*

My work in typhoid, pneumonia, and tuberculosis has taught me not to minimize the importance of anaphylaxis. This factor applied in the employment of vaccines and sera for the prevention and treatment of infective diseases serves as a governor or guide. *Anaphylaxis is in reality not due to idiosyncrasy. It is the measure of the therapeutic effect of a vaccine or sera. Anaphylactic shock can be prevented by the administration of small doses of the indicated serum. This preparation of the patient is as necessary as the preparation for a major surgical operation. It is the common sense application of physiological and therapeutic principles.*

The anaphylactic phenomena in respiratory diseases is more evident and important than in any other group of diseases. In an individual with acute respiratory catarrh a moderate dose of mixed vaccine will cause a marked local and general reaction. The individual free from such infection shows little if any reaction after the administration of a moderate dose. The activities of the causative infection develop an anaphylaxis. This phenomena is almost always present and diagnosis can be made without any clinical evidence by noting the results of the inoculation of an applicable dose of mixed vaccine made from cultures found in respiratory infections.

The local and general symptoms found following the administration of mixed vaccine in an individual suffering from a respiratory catarrh are similar to those in pulmonary tuberculosis following a dose of tuberculin. This anaphylactic phenomena serves as a valuable guide as to dosage and interval in vaccine theraphy.

Symbiotic activities of micro-organisms is much more appreciated now than formerly. The preparation of an autogenous vaccine for respiratory infections from the sputum should incorporate all micro-organisms commonly found. By this method all pathologic organisms developing on human blood agar should be given proper consideration. All cultures and subcultures should be kept under observation for five or six days in order to provide for the organisms of slow growth. A mixed vaccine prepared after this manner gives more satisfactory clinical results.

The individualistic factor should always be under observation. Some persons go through life entirely free of respiratory infections while others are affected from time to time with some one of the diseases until they become chronic. Acute exacerbations may occur and the spread of infection by means of droplets sprayed into the air in sneezing, coughing, and other expulsive actions is not uncommon. It is from these carriers that, in many instances, epidemic and even pandemic respiratory diseases have a beginning. This is best illustrated by the recent pandemic.

It is undoubtedly true that the initial infection in this pandemic was B. influenza, but other organisms as streptococcus, M. catarrhalis, streptococcus mucosis capsulatus, streptococcus hemolysins, and pneumococcus rapidly became of considerable etiological importance. The majority of cases diagnosed as influenza were not true influenza, but due to mixed infection. A most interesting point in the influenza epidemic in the United States was the fact that the most serious cases did not occur in the young, old, and feeble, but in the robust adults in their prime. As evidenced in our army camps, physical fitness did not insure against attack from respiratory infections. The use of prophylactic vaccines against infective respiratory diseases has proven that specific immunization can be established successfully.

Whenever and wherever individuals are closely associated and mingle in social and commercial intercourse, virulent organisms, in the air from coughing, sneezing, expectorating, etc., are always present. They gain ready access to the respiratory tract through inspiratory currents of air, and to vulnerable points. The lung tissues richly supplied with blood are readily attacked because of their delicate structure. Irritant and noxious vapors, bacterial toxins, or foreign bodies constantly attacking these tissues predispose to respiratory diseases and incidently to constitutional weakness. This weakness or acquired susceptibility can be successfully overcome by specific immunization against air breathed pathogenic bacteria.

Influenza is probably due to an organism which was described by Pfeiffer and others in 1892. It is present in lachrymal, nasal, and bronchial secretions, and is also found in the lung when pneumonia complicates the disease. It is one of the smallest bacilli known. This organism is always associated with other infections as, the M. catarrhalis, pneumococcus, etc. Influenza is endemic in Northern Central Asia, and at intervals travels westward from this region by the principal trade routes. It spreads at a rate corresponding to the most rapid means of transportation. It is a communicable disease which attacks a large proportion of the population within a short time.

Epidemics of influenza have occurred at various times in North America since 1627. The pandemic of 1889-90 was of unusual virulence. The pandemic of 1918-19 surpassed that of 1889-90 in virulence and varied complications. The peculiarities of this disease during the last pandemic were such as to place the etiology in the uncertain class.

Bacteriological findings have not proven whether the disease is due to a filterable virus or to ordinary bacteria.

I shall call attention again to the individual factor in this disease. Some authorities have found the influenza bacilli predominating, others the streptococcus viridans, streptococcus hemolyticus, M. catarrhalis, diplococcus mucosis, and often pneumococcus. Some individuals have a natural or acquired immunity to these bacteria, others a low resistance. The inoculated individual recovers, if attacked at all. The non-inoculated individual of low resistance when attacked succumbs or slowly recovers, and here lies the secret of high or low mortality.

Most all authorities disagree concerning the number of the various bacteria isolated, but agree on the fact that in practically all severe cases of influenza, pneumococcus, streptococcus, staphylococcus, M. catarrhalis, bacillus mucosus capsulatis, and streptococcus viridans are found.

The prophylactic measure may be summarized as follows:

1. Keep the system in good condition.
2. Avoid needless crowding.
3. Walk instead of riding in street cars, when possible.
4. Retire early, rise early.
5. Remain in open air and sunshine as long as possible.
6. Avoid poorly ventilated places.
7. Breathe through the nose, and do not allow the mouth to be a gateway for infection.
8. Clothing should be loose, warm, and the feet kept warm and dry.
9. Avoid talking, sneezing, coughing, spitting, and snuffling persons.
10. Avoid cooking and eating utensils, etc., used by others, unless properly sterilized.
11. Avoid houses and districts where there is influenza.
12. Wear face masks to protect nose and mouth, and goggles to protect the eyes in hospitals, sick room, or other places where liable to infection.
13. Isolation and treatment of carriers.

14. Destruction or isolation of animal carriers.

15. Proper sanitary measures in the care of those ill with influenza in order that the infection will not be spread.

16. Keep secretions of the body neutral or alkaline by the use of sodium bicarbonate, or other suitable alkali.

In 1880, Pasteur and Sternberg described a coccus found in human sputum which was called coccus of sputum septicemia. Fraenkel, in 1884, published an accurate and detailed description of the characters of the pneumococcus. Since that time the pneumococcus has been recognized as the chief factor in the etiology of acute pneumonia. The knowledge of today, however, from a bacteriological and clinical standpoint, considers various factors as the cause of pneumonia. It is my purpose to show that our present viewpoint is the most logical.

A series of cases of acute lobar pneumonia selected as typical cases were investigated. The sputum was carefully collected and within two hours inoculated into white rats. In each case, cultures were made upon human blood. Cultures from the heart blood of rats that died, were made on human blood agar. Cultural examination revealed pneumococci, staphylococci, streptococci, M. catarrhalis, streptococcus mucosis capsulatus, B. influenza. In 47 per cent. of the cases, the pneumococci were a negligible quantity.

In pneumococcal infections, there is no constant lesion in the lung. The pathological lesions vary from lobar, or broncho-pneumonia to indefinite distribution of pathologic processes. Bacteriological examination does not corroborate the evidence that the pneumococcus is the sole etiological factor.

The majority of pneumonias diagnosed as typical are as a matter of fact atypical. The stereotyped diagnosis of a catarrhal pneumonia, or a broncho-pneumonia is as false as it is obsolete. The fact also remains that the diagnostician is not, as a rule, the clinician.

Many years of experience has taught me that all infections are more or less mixed infections. I refer here again to my observations in such infections as typhoid, tuberculosis, and colonic infections. Our so-called pneumonias may exist, with or without pneumococci. The organisms commonly found in atypical pneumonias are, staphylococcus, M. catarrhalis, streptococcus, streptococcus hemolysins, B. Friedlander, B. influenza, pneumococcus.

The prima-facia evidence as to the etiological factors of pneumonia gives therapeutic value to mixed vaccines prepared from numerous strains of prevailing organisms. Prophylactic inoculation has reduced the mortality. The mortality has been enormously reduced by therapeutic inoculation.

The prevalence of pneumonia in our army camps, in 1918, and in cities in the United States in which influenza raged for months, was much more marked than in previous epidemics. The appalling mortality was almost entirely due to the so-called pneumococcic infections. The "follow-up" examinations of sputum and lungs demonstrated that the conditions were due to mixed infections. This infection in the greater number of cases increased in virulence until a septicemic type developed.

As soon as the epidemic started requests from all points of the compass came to the profession for a vaccine to prevent and combat this disease. These requests were met with numerous vaccines of questionable value. Some had stable potency while others had no preventive or therapeutic worth. In November, 1918, several biological laboratories produced vaccines of value. The employment of these compound vaccines produced highly satisfactory results. The use of a compound or mixed vaccine for the treatment of pneumonia and other respiratory infections is of material aid to the physician who does not have the aid of an experienced bacteriologist. Further, regardless of the respiratory disease, the keen and observing clinician can apply a vaccine prepared along the above lines. The simplicity of therapeutic application of mixed vaccines commends them to the physician.

The valuable experimental work carried out in this country by Cole, Rosenow, and others; the work in South Africa by F. G. Lister, J. P. Johnson, and others, has proven to be the foundation of preventive and curative measures in pneumonia and other respiratory diseases.

I shall not discuss the laboratory problems of prevention carried out by the many investigators, but refer briefly to the strains of pneumococcus. Recent advances in bacteriology have, in a measure, made the subject more complete and difficult. During the years 1904-8, in my work on "Insect Carriers of Typhoid," I isolated 24 strains of bacilli between the typhoid and the colon, thus establishing a connecting link. This connection was disputed at the time. Since then we have been forced to accept typhoid A, B, etc., and various strains causing dysentery, pneumonia, etc. I have always believed in the phenoma of "mutation." My observations in noting the changes of the specific characteristics of the typhoid micro-organisms have been confirmed. I also have every reason to believe that the phenomena of mutation holds in most, if not all, micro-organisms. Bacteriologists may not, at this time, be able to classify all the changes, but in due time will be able to do so. It is not for the clinician to wait until this is accomplished, but to devise a means for the prevention of such infections. The recognition of the different strains has been of much practical value in enabling the preparation of vaccine from individual and mixed virulent strains.

It has been the tendency, in recent years, when success has not been achieved by a vaccine theraphy or prophylaxis to attribute, this lack of success to an unidentified strain of micro-organism. This was noted in the experiments carried out on the Rand in South Africa and more recently in our army camps. It has been proven beyond a reasonable doubt, that therapeutic and prophylactic vaccines cannot be prepared from one individual micro-organism as a basis.

My experience has taught me that in the preparation of various vaccines the problem of variation in bacteria is practically solved by the preparation of vaccines and sera from a large number of unidentified strains. The number of strains employed does not affect the potency of the vaccine provided each strain is a virulent organism exhibiting the chief characteristics of the particular organism and is recently isolated from a definite pathological condition.

The preparation and dosage of a particular vaccine should be limited to that vaccine and not applied to other vaccines.

Dr. G. D. Maynard, Johannesburg, reports the investigation of experimental inoculation carried out by the Rand mines with Lister's vaccine, in which 55,900 natives were employed, with the following conclusions:

1. That the attack rate from pneumonia is apparently lessened by inoculation, a small positive correlation being obtained.

2. That there is little or no evidence that the case mortality is favorably affected by inoculation.

His report is at variance with that of Wright and Johnson. Major Johnson, in discussing this report, says, "he is unable to give any satisfactory reply as to whether the vaccine prepared by Lister from identified strains offers any advantage over the vaccine previously prepared by Wright from non-identified strains. On the face of it these conclusions are paradoxical. To claim protection against a particular disease, at the same time to admit that the mortality among the inoculated is not favorably affected, is entirely at variance with the experience gained of preventive inoculation in other diseases. It has been the universal experience that among the individuals previously inoculated against typhoid and paratyphoid fevers, who in spite of inoculation developed the disease, *the mortality is considerably reduced*, the disease tending to be mild and free from complications."

Johnson discusses at length the results obtained at Kimberley and on the Rand by Lister. He states that "these results are in accordance with bacteriological findings as pneumococcus alone has been a comparatively unimportant factor in the heavy mortality during the prevailing epidemic." "In conclusion," he says,

"it is necessary to state that the failure in the present method of prophylactic inoculation against pneumonia is due not to the presence of an unidentified strain or strains of pneumococcus, but to the fact that the etiological importance of other organisms, especially M. catarrhalis, streptococcus, streptococcus mucosus capsulatus, B. influenza, B. Friedlander, B. septicus, and staphylococcus has not been appreciated. The employment of a highly multivalent vaccine prepared from numerous recently isolated virulent strains of the above organisms enormously reduces the incidence of pneumonia and other respiratory diseases (excluding tuberculosis) and markedly reduces the mortality of these diseases. It is also significant that the individuals inoculated prophylactically with the mixed vaccine shortly before the prevailing influenza epidemic appeared in South Africa have escaped infection or only suffered from mild attacks free of complications."

During the epidemic in Tulsa and environs, I gave 685 prophylactic inoculations of influenza vaccine. Five of those who had been inoculated were attackd with influenza but the disease was mild and free from complications. Eighty per cent. of those inoculated had severe reactions following each injection, fifteen per cent. mild, and five per cent. had no reaction.

In conclusion, I should like to place on record my appreciation of the valued assistance and loyal support of the members of the medical profession in Tulsa, C. H. Hubbard, Mayor of Tulsa, the Tulsa Health Department, Dr. C. L. Reeder, County Health Officer, Dr. John W. Duke, former State Commissioner of Health, in their noble efforts, in the prevention of influenza and allied diseases during the epidemic of 1918-19, that gave Tulsa the lowest mortality rate of any city in the southwest.

Suggestions relative to prophylactic measures as a means for the control of influenza:

1. Knowledge should be disseminated, at appropriate periods, to the laity by means of school texts, and other literature, laying particular stress upon the gravity of communicable respiratory diseases.

2. Laws providing for the control of influenza and other infectious diseases which often become epidemic and pandemic.

3. Incorporate in our medical texts facts in regard to influenza based upon clinical evidence, and not clinical evidence based upon obsolete texts.

4. Statistics on various forms of prophylaxis in influenza and allied conditions available for physicians.

Summary.

1. Anaphylactic and anti-anaphylactic phenomena are valuable guides in vaccine theraphy of influenza and allied diseases.

2. Symbiosis is an important factor in bacterial infections of the respiratory tract.

3. In a diathesis brought about by constitutional weakness, specific immunization with a highly multivalent mixed vaccine prepared from numerous recently isolated virulent strains of pathologic bacteria commonly found in the respiratory organs will reverse the resistance.

4. Approximately 47 per cent. of cases diagnosed as pneumonia in practice are traceable, primarily, to infection with pneumococcus. The percentage is often found much less in many series of cases.

5. In all cases of pneumonia mixed infection with M. catarrhalis, streptococcus, B. Friedlander, streptococcus mucosus capsulatus, staphylococcus, B. septicus, are found as important factors.

6. Clinical results in practice from prophylactic and therapeutic inoculation for influenza and pneumonia with a mixed vaccine give prima-facie evidence of undoubted value.

7. A mixed vaccine prepared from recently isolated strains of virulent

bacteria of the respiratory tract, in curative therapeutic, or prophylactic dosage, the actual dose should be a little less than that of a particular organism used separately.

8. These views were confirmed during the last epidemic of influenza, 1918-19. The heavy mortality was due to pneumonia. The mortality from pneumonia has been greatly reduced by the use of mixed vaccines. Prophylactic inoculation with larger doses of mixed vaccine has reduced the incidence of influenza and prevented pneumonia.

9. The failure of preventive vaccination against pneumonia with various pneumococcus vaccines is due to inadequate knowledge of the etiology of the disease so often diagnosed as pneumonia. A purely pneumococcic vaccine is of no value unless the pneumococci predominate. Then it should only be used in connection with the mixed vaccines.

10. The failure of various vaccines during the last epidemic was due to inaccurate and incomplete knowledge of the etiology of pneumonia. The hard-shelled clinicians whose ego has cost the lives of thousands and tens of thousands will have to leave their darkened cells and get out in the sunlight and fresh air with the pathologist, bacteriologist, and sanitarian, in an endeavor to work together for the benefit of progressie medicine and mankind.

11. Prophylactic inoculation with mixed vaccines prepared from pneumococcus, M. catarrhalis, streptococcus, streptococcus mucosus capsulatus, B. Friedlander, staphlococcus, B. influenza, B. septus, with such other strains as deemed necessary, will enormously reduce the incidence of influenza, pneumonia, and other respiratory diseases (excluding tuberculosis), and largely reduce the mortality from these diseases.

12. The actual composition, proportion, and dosage must be governed by a close and comprehensive study of the micro-organisms found in the respiratory tract.

Discussion.

Dr. H. T. Price, Tulsa: It seems to me, that we have first of all to combat the decided opinions of the people. We have to educate them that the health authorities must do with them as they see fit, and along that line we would have to do again approximately what we did during the last epidemic. We would not have to have our people close the picture shows, churches, etc. We would have them educated to keep away from each other when epidemics get into our midst. When this influenza epidemic was among us, our people were not aroused as they were later, and it was very hard to keep a case of influenza isolated. I recall one case that was very severe. One day when I called on him he was very ill, the next day he was in the barber shop being shaved with the same razor used on others. Now our cities have not the money to do all they could. They should have a full time health officer. That would be a tremendous help to us. The wearing of gauze masks is very good and is sometimes successful, but it must be done properly. When you say to an entire city, "You must wear a mask on the street," that does not count much because they may wear it wrong, and that is no prevention. Now, the fact can be accounted for that the youth of the country was stricken for the reason that they got out more. So far as the bacterial prevention is concerned we do not know yet what the cause of influenza is. We positively do not know. The use of vaccine in some cases has proven of worth, and in others no use at all. With any stock vaccine we will probably not have any success. It must be a specific vaccine because in controlling an epidemic in certain cities of certain states it would seem that first of all we must have knowledge of the bacteria prevailing in that vicinity. There is a difference in different localities. The question of vaccine immunity has not yet been solved so far as I can see.

Dr. Lea Riley, Oklahoma City: This has been a very absorbing subject for the last nine months and there are lots of things we have done and thought they were absolutely right that did not do the work. It seems that an epidemic

of poliomyelitis preceded this in other countries. We have never effectively found the bacteria for poliomyelitis. The same way with this. I personally think there must be a germ. There are things we do not understand about this epidemic. For instance the city of San Francisco closed all their public gatherings early; everyone had to use a mask, and San Francisco was hit as hard as any other city. On the other hand, New York, one of the most thickly populated cities of the world, was less hard hit and they did not hardly use masks. There are lots of things about this I do not know.

Dr. W. R. Leverton, Hobart: I enjoyed the doctor's paper very much. I think when we study the condition more a great deal of good will be brought out. I want to agree with Dr. Price on the use of vaccine. I was located where we had 250 influenza patients. We did not use any vaccine, only the ordinary measures, plenty of fresh air and the enforcement of a mask. Our percentage of infection was probably a great deal lower than in some localities. We cannot say that the use of vaccine is going to absolutely prevent or even relieve, because we did not use these things. I think our rate was 35 per cent. of what it was in the rural districts.

Dr. A. B. Leeds, Chickasha: I had quite a little experience with the influenza, having had a "Flu" jaunt over the state in the U. S. Public Health work, and fortunately for me my last location happened to be among the full blood Indians. You perhaps all realize the tendency of Indians to succumb to repiratory disease and lack of sanitation. The two cases I saw happened to be a case of influenza pneumonia. I gave this Apache woman the serotherapy. I went back to see her the next day. She was lying on the floor as they all do when they are sick unless they think they are going to die. We had 360 cases of "Flu," 64 cases pneumonia, with four deaths, among those Indians. Previously they had been dying at the rate of six or eight a day at that agency. My other experience with the serotherapy convinced me there was more in that than in any form of treatment. Within six days the epidemic among these Indians was entirely stopped.

Dr. J. W. Duke, Guthrie: I think perhaps there has been enough said upon this subject, but I am constrained to say just one word to you gentlemen on the public health matter. Your best interest in these matters is to co-operate with the Board of Health. I had quite a number of experiences as former commissioner. We decided to put on a state-wide quarantine. The co-operation came from quarters least expected. I know you all agree that ignorance is the worst enemy we have to overcome, but the rank and file co-operated more fully with the State Board of Health in maintaining quarantine than the high-brows. The greatest trouble we had in maintaining quarantine came from the institutions. The other came from the churches. They insisted on maintaining services. I cannot think of a picture show that did not co-operate with the State Board of Health in closing their doors. Those people need education. The city of Tulsa gave the State Board of Health absolutely no trouble at all. On the other hand everyone there from the mayor, health officer, city police and everybody did everything they could to carry out the instructions of the State Board of Health. Do you know how many died in Oklahoma during this epidemic? Something more than 4000 people died in Oklahoma in 90 days. More than 400,000 died in the U. S. from this disease. So in the prevention of influenza the best means at our hands today is to combat that disease by isolation, scattering the crowds, eating wholesome food and walking to and from home instead of using public conveyances, until some bacteriologist makes a vaccine that is a specific for these cases. I wrote the Government for a good supply of vaccine and I distributed it as intelligently as I could where I thought it would do the most good, and the reports received from those using this serum were all encouraging. My personal experience is about 25 persons. Eight of those persons contracted influenza, but none had pneumonia. None of them died and I am inclined to believe that some vaccine or serum will be evolved soon that will be all right. There must be more scientific work done than has been done. My

personal experience with those who had pneumonia was they all died. They died all over Oklahoma. Our physicians did as well as they did elsewhere. The quarantine carried out by the State Board of Health did not do much good.

Dr. L. J. Moorman, Oklahoma City: I was very much interested in Dr. Dutton's paper and I think he deserves credit for the energetic part he took in regard to the treatment of this disease in the city of Tulsa. From all the stress which has been brought about by this influenza, it seems to me that only one therapeutic measure stands out as unquestionable in its value. After all the experimentation and study of this disease there is no uniformity of opinion in regard to the treatment except as I stated awhile ago, not one thing, and I believe every doctor in this room will agree to that one thing, and that is rest. I am sure everyone who has had anything to do with the disease has seen the result of rest. I want to refer to the point Dr. Duke made awhile ago, I think we might say this, that many of these cases of influenza had pneumonia. It is not always easy to discover it. Many cases of pneumonia in epidemics recover.

Dr. Dutton, closing: I desire to thank those who have discussed this paper so freely and fully. I have been using the vaccines for a number of years. I believe my first experience was in the year 1910, which was advocated by most authorities, to use the pneumococcus alternately with streptococcus. The experience I had was not very satisfactory and I have been treating my cases as many do, in the best way as symptoms developed. I believe it was at the meeting we had at Medicine Park that I got into an argument with Dr. Leeds in regard to mixed vaccines, and since that time I have had considerable experience.

MENINGITIS AND INFLUENZA.

F. H. Stangl, Chicago (*Journal A. M. A.*, Oct. 4, 1919), notices in the reports of the pandemic of influenza references made to toxemia and to the symptoms of shock and meningitis, and quotes a number of authorities who have specially mentioned such conditions. He has, therefore, reviewed again the records utilized by Keeton and Cushman, with the addition of those which have accumulated since their report, a total of 3,400 cases, and finds that nearly 1 per cent. of the total showed symptoms suggesting meningitis or cerebral involvement, ranging from slight neck rigidity and bilateral or lateral Kernig reactions to deep delirium and marked stiffness of neck, and in one case to opisthotonus. Eight fatal cases, variously diagnosed as epidemic meningitis, uremia, tuberculous meningitis, apoplexy and polyarthritis, proved, on necropsy, to be influenza with marked lung involvement. The polyarthritis case is reported, the meningeal symptoms being most prominent. Another group of cases diagnosed as influenza-pneumonia or meningism, comprising twenty-one cases, including seven deaths, is tabulated. In all, rigidity of the neck was noted, the Kernig sign was positive in thirteen, and in six the Brudzinski sign was positive, and opisthotonos was present in one. The necropsy findings showed the usual influenzal lesions. The brain and its membranes presented only congestion and edema. The author summarizes as follows: "A severe toxemia and active delirium with definite meningeal manifestations such as is encountered in systemic infection and the acute exanthems occur in some patients suffering from influenza and influenzal pneumonia. The clinical picture in some instances closely simulates that of an actual meningitis or other intracranial causes of delirium and unconsciousness, and postmortem examination fails to reveal any inflammation of the brain or its membranes."

CLINICAL REPORT OF TWO CASES OF TRAUMATIC ASPHYXIA.

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In October, 1918, Mr. and Mrs. S., about 35 and 30 years of age respectively, while riding in a Ford touring car collided with an automobile resulting in their car being overturned, pinioning both of them underneath it. Their bodies remained between the car and the pavement for some time until the car was lifted from them and they were removed to the Oklahoma Hospital.

The most interesting feature connected with the recognition of the group of symptoms, which has been designated as that of *traumatic asphyxia*, is the comparative rarity of the disease.

The marked cyanotic discoloration of the skin of the head, face and neck terminating abruptly about an inch internal to the edge of the trapezius muscle, following the squeezing or severe injury of the chest and abdomen, has been graphically depicted in Plate 8, Page 908, Vol. I, Keen's Surgery.

The cyanotic color of the man was typical but the discoloration was not so marked in his wife. The thoracic compression resulted in fracture of ribs, a lung penetration and consequent emphysema in both cases. The sub-conjunctival hemorrhage was more marked in the man.

Treatment: The patients were given the customary emergency attention on arrival at the hospital, made comfortable, fractured ribs immobilized, morphine given to control pain, plenty of air and supported in an upright position in bed as this seemed more satisfactory than any other. In fact, the patients insisted upon the sitting or half reclining posture during their entire convalescence, which lasted some three weeks. Both patients recovered.

This report is presented because of the comparative rarity of the condition and the very striking appearance of one who has sustained such an injury.

FOREIGN PROTEIN IN PNEUMONIA.

C. W. Wells, Camp Travis, Texas (*Journal A. M. A.*, June 21, 1919), reports the results from the intravenous injection of a foreign protein in eleven cases of influenzal pneumonia. Nine of the patients were critically ill, and the prognosis, grave. "The protein used consisted of typhoid bacilli, macerated and exposed to the soluble action of alcohol for 12 hours, washed free of alcohol and suspended in physiologic sodium chlorid solution, the concentration being the equivalent of approximately three million bacilli per cubic centimeter. The dose employed was sufficient to produce a definite so-called protein reaction, as a rule 1 c.c. Leukocyte counts were made previous to the injections, and from four to twelve hours following the reaction. In several cases blood chemistry determinations were made before and after the injections." Thirty to forty-five minutes after the injections a typical protein reaction occurred, with severe chill and moderate cyanosis, followed by profuse sweating and a marked elevation of temperature. Shortly after this the patient felt decidedly better and seemed improved. In several cases there was a rapid crisis after the fever with no subsequent rise of temperature. Several cases are reported and a table of blood examinations given. Wells also reviews the literature of similar treatment by others. So far as can be determined, the intravenous injections of typhoid protein had no deleterious effect as regards increased retention of the products of catabolism. It is his opinion that the method is efficacious in selected cases, but should not be used as a routine by the general practitioner.

PROCEEDINGS OF THE ST. ANTHONY CLINICAL SOCIETY.

DR. LE ROY LONG, President. DR. LELIA ANDREWS, Secretary.

DEATH REPORTS.

Dr. LeRoy Long. *Atropic Cirrhosis.*

Mrs. P., housewife, age 50. Influenza in December, 1918. Patient came to the hospital with edema of extremities and fluid in the abdomen. 5,000 c.c. of straw-colored fluid of sp. gr. 1.006 was removed, but it reaccumulated rapidly.

Six days later, Talma's operation was done in order to establish compensatory circulation by the formation of new blood vessels in adhesions between the omentum and the abdominal wall.

In making the incision to the right of the median line, an abnormally large vein the size of a little finger was injured. The liver was retracted and contracted much above the rib margin. It was about one-fifth the normal size and "hob-nail" in character. The fluid was removed from the abdomen and the peritoneum rubbed with gauze and the omentum sutured to it.

The patient left the table in good condition but sixty hours later she developed Cheyne-Stokes' respiration and seventy-two hours later she was unconscious. At the end of eighty-two hours she died in a convulsion.

In this case, in my judgment, death was due to several factors:

1. The liver, on account of disease, was not able to perform its function. Urea and other waste material was stored up in the blood.

2. The portal circulation was greatly embarrassed on account of the damage done to the already existing compensatory circulation.

3. There was poor kidney function—as shown by the very scant urinary output.

4. There was undoubtedly edema of the brain as manifested by Cheyne-Stokes' respiration. This may have developed in connection with the decreased kidney function.

Dr. J. F. Kuhn. *Strangulated Inguinal Hernia. Post-operative Pneumonia.*

Mr. M., age 60. Very large and obese. Patient came to the hospital with intestinal obstruction, severe abdominal pain and temperature 102.4 degrees. His heart and lungs were negative. There was a left inguinal hernia which had become strangulated. On incision, the bowel was found to be very dark, but when the hernia was reduced, it regained its color and the patient left the table in good condition.

Two days later he developed a condition resembling influenza pneumonia with gradually deepening cyanosis and rales which began as crepitant clicks and extended from base to apex. He died as a result of the extensive involvement of the lung.

Autopsy showed the right lung adhered to the diaphram. It was all dark red and infiltrated except at the apex. The bronchi were filled with a thick white viscid material.

CASE REPORTS.

Dr. Horace Reed. *Gastric Carcinoma causing pyloric obstruction.*

Mr. John F., age 66. The patient, a very emaciated old man, came into the hospital complaining of: (1) Intestinal obstruction, (2) marked loss in weight.

The obstruction came on about three weeks ago and was located at the pylorus. He would vomit within two hours after eating. The vomitus is sour and lately has become "coffee grounds" in appearance. He has not been able to retain any food for three weeks, during which time he has not had a bowel action. He had

taken laxatives but they were vomited. He has lost fifty pounds in weight in the past two months, and is very weak and emaciated. Fluoroscopic examination showed an empty duodenal cap, very inactive peristalsis, and retained food and gas. X-ray with barium showed filling defect in duodenal cap and retention.

This was a case in which there was not time to work out thoroughly the details of the case. The history and physical examination point to malignancy, but it was evident that something had to be done immediately or he would die of starvation. There was clearly a pyloric obstruction which was due, we thought, to a malignancy.

In a man of his age with marked arteriosclerosis and a mitral systolic murmur, we thought it best to use local anesthetic. Local infiltration with one-half per cent novocain solution made a satisfactory anesthetic.

Posterior gastrojejunostomy was done and the abdomen closed without drain. There was such extensive growth of the malignant mass that its removal was impossible.

The patient improved nicely and you see him here tonight, three weeks after the operation, with a healed abdominal incision. Recent x-ray plates show that food is passing through the new opening.

We could not even hope for a cure in this case. The operation only gave him a little more time in which to arrange his affairs to meet the fatal issue which surely cannot be very far away.

Dr. Lea A. Riley. *Gastric Carcinoma.*

Mr. H., age 64, Austrian, occupation, farmer. Patient came into the hospital complaining of jaundice, general weakness and marked loss in weight. He has lost fifty pounds in weight in the past six months and has gradually become very jaundiced, but his exhaustion has come on in the last four weeks. Since that time he has had considerable nausea and vomiting.

He is very emaciated and his skin is of a lemon yellow, the pigment being evenly distributed over his body. Liver palpable 3 c.m. below costal margin. Veins of abdominal wall distended but no "caput medusa." R. B. C. 3,200,000. W. B. C. 7,400. Poly's 72. Lymphs 28. Pancreatic efficiency tests showed 20 units in the urine and almost 0 units in the feces, indicating some obstruction to the outflow of pancreatic enzymes.

X-ray shows a prepyloric indentation, a distorted caput and retention at the end of forty-eight hours.

This is a case which conforms nicely to Courvoisier's law. That is; a painless persistent jaundice with a distended gall bladder points to obstruction probably due to malignancy.

By keeping him in bed and giving him good diet, his condition was slightly improved and he was transferred to surgery with a diagnosis of grastric carcinoma involving the pancreas with possible metastasis in the liver.

Incision showed a mass on the posterior wall of the lesser curvature of the stomach, a hard friable pancreas surrounded by a mass of enlarged lymph glands, and enlargement of lymph glands along both borders of stomach extending to the cardiac region. Gall bladder greatly distended with nodules at the juncture of the cystic and common duct.

The involvement was so extensive, the operation was impossible and he was closed without drain.

The mass near the pylorus which was also shown by the x-ray accounts for the persistent vomiting. The enlarged pancreas shut off the duct as was indicated by the pancreatic efficiency tests. No doubt, this with the nodules about the liver caused the obstructive jaundice.

Very little can be done for this case and the final result will be death from exhaustion and toxemia.

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Articles sent this Journal for publication and all those read at the annual meetings of the State Association are the sole property of this Journal. The Journal relies on each individual contributor's strict adherence to this well-known rule of medical journalism. In the event an article sent this Journal for publication is published before appearance in the Journal, the manuscript will be returned to the writer.

Failure to receive the Journal should call for immediate notification of the editor, 307-8 Surety Building, Muskogee, Okla

Local news of possible interest to the medical profession, notes on removals, changes in address, deaths and weddings will be gratefully received.

Advertising of articles, drugs or compounds unapproved by the Council on Pharmacy of the A. M. A. will not be accepted.

Advertising rates will be supplied on application. It is suggested that wherever possible members of the State Association should patronize our advertisers in preference to others as a matter of fair reciprocity.

EDITORIAL

THE "NEW" REMEDIES FOR MALARIAL CONTROL AND TREATMENT.

Offering nothing new, but strikingly reiterating that which almost every physician thought he knew and understood, is the issuance by the International Health Board to its medical officers a statement or concensus of opinion as to the above matter. The work of Dr. C. C. Bass (see page 168, Journal Oklahoma State Medical Association, June, 1919), is noted and summarized as follows: The study was for control by sterilization of patients and carriers and concludes that quinine sulphate is the best form for routine use, oral is preferred to intravenous or intramuscular application, daily doses over long periods disinfects more cases than when the treatment is broken into a few days of the week. Ninety per cent. of all can be disinfected by oral administration of 30 grains daily, divided into three doses in the acute stage, to be followed by ten grains daily at bedtime for eight weeks. Children under fifteen are given the same drug, but in doses of one-half grain for the infant under one year, 1 grain for one year old, 2 for two years old, 3 for three to four years old, on to eight grains for children up to eleven to fourteen years of age.

The studies of Lieutenant Colonel J. W. Stephens of the Liverpool School of Tropical Medicine and his associates made in Asiatic countries and at Salonika note "useless drugs" which neither controlled temperature paroxysms nor destroyed parasites, as: Tartar Emetic, administered intravenously; Amylopsin and Trypsin, intramuscularly; Quinotoxin by the mouth; Colossol manganese and Liquor arsenicalis.

"Palliative drugs," which partly controlled but allowed relapse were: Novarsemobilin, Disodoluargol intravenously, and Quinine sulphate (3) grains daily or under, administered either intravenously, intramuscularly or orally.

"Curative drugs," which controlled the acute attacks and prevented relapse; 1st, Quinine sulphate orally, 90 grains daily for two days, 60 per cent. cures; 45 grains daily for three to eight weeks, 64 per cent. cures; 45 grains Satuday and Sunday for eight weeks, 72 per cent. cures.

Quinine hydrochloride, 15 grains intramuscularly for two days followed by liquor arsenicalis B. P. by mouth for eight weeks, omitting treatment for entire third and sixth weeks. Combined quinine-arsenic treatment yielded 87.8 per cent. cures.

These conclusions seem to be worthy of more than perfunctory trial. They are based on unusual observation in many thousands of cases by experienced observers who took nothing for granted. Their promise held out to the physician is that exact and painstaking administration will cure most cases. We know fro m experience that half-hearted methods result only in half hearted cures, so it behooves those having this very crippling infection to deal with to insist on thorough and painstaking administration of the only drug yet known to be effective—quinine—and in proper form to effect a permanent cure.

PERSONAL AND GENERAL NEWS

Dr. W. O. Thompson, Kusa, is moving to Hanna.

Dr. W. A. Aitkin, Enid, has returned from overseas service.

Dr. C. L. Hill, Haskell, is arranging to open a hospital in that city.

Dr. S. A. Welch, Dacoma, attended the New York Clinics in October.

Dr. W. E. Rammell, Bartlesville, is recovering after an operation for gall stones.

Dr. S. P. Strother, Holdenville, announces that he will move to Oklahoma City.

Dr. W. G. Omer, Thomas, is taking steps to have the Thomas Hospital enlarged.

Dr. Julian Field, Enid, has been doing special work at Harvard for some time past.

Dr. A. G. Cowles, Ardmore, is visiting clinics in Cleveland, New Orleans and Chicago.

Drs. Wallace and Bolend, Oklahoma City, announce the dissolution of their partnership.

Dr. C. E. Calhoun, Sand Springs, has returned from army service overseas and is at his old location.

Dr. J. G. Edwards, Henryetta, is moving to Okmulgee and will form a partnership with Dr. W. M. Cott.

Dr. A. L. Stocks, Muskogee, attended the meeting of the Southern Medical Association in Asheville in November.

Dr. R. O. Early, Ardmore, announces that he will open a clinic for the treatment of eye conditions in Ardmore children.

Dr. Thos. H. Flesher, Edmond, and Miss Margaret Elizabeth Cherry, Ardmore, were married in the latter city, October 18.

Drs. H. C. Weber and A. North, Bartlesville, representing Washington County Medical Society, will formulate plans for the establishment of a laboratory.

Dr. and Mrs. L. T. Strother, Nowata, celebrated the anniversary of their golden wedding October 21st. Dr. Strother was formerly one of the Councilors for the State Medical Association.

Drs. J. H. Scott and W. M. Gallaher, Shawnee, and C. S. Pettey and E. O. Barker, Guthrie, attended the meeting of the American Railway Surgeons Association in Chicago in October.

Tulsa County Medical Society, on motion offered by Dr. Fred S. Clinton, offers a reward of $500.00 for the arrest and conviction of any Tulsa County physician found guilty of performing criminal operations.

Armour and Company has taken precautions among plant employes against a return of the "flu" epidemic in Chicago and other cities where the Armour plants are located. All employes have been notified that without charge they may have the influenza vaccine administered according to the formula of Dr. E. C. Rosenow. In addition to offering this vaccine free to employes, a general educational campaign along health lines and particularly with reference to the "flu" is being carried on among the workers in the plant. Dr. Volney S. Cheney, medical director of Armour and Company, reports that the employes are taking an interest in the campaign and that as a result no serious recurrence of influenza is looked for among Armour workers.

DOCTOR C. D. ARNOLD.

Dr. C. D. Arnold, El Reno, died in that city October 27th after a short illness. Dr. Arnold had not been in good health for many years, but continued his work until a short time ago.

He was born in Hardin County, Kentucky, in 1845, and after common school and college courses, graduated from the Medical Department of the University of Louisville in 1876. Dr. Arnold came to Oklahoma, locating at Kingfisher, April 22, 1889, on the date of the opening to settlement of Oklahoma Territory, soon after that he moved to El Reno which had been his home since that time. In 1894 he was appointed Superintendent of Public Health for Oklahoma Territory, which position he held for two terms. He is survived by his wife and one married daughter. Interment was had in the El Reno cemetery.

The United States Railroad Administration announces that local surgeons hereafter will be supplied transportation on foreign lines to attend medical meetings when application for transportation is made showing the meeting or clinic they expect to attend. The transportation so issued will not be available to families of local surgeons.

University Hospital, Oklahoma City, was formally dedicated Thursday, November 13; the exercises taking place in the House of Representatives Chamber, State Capitol, 2:00 P. M. On the program Honorables J. W. Kaysor, State Board of Affairs; Samuel W. Hayes of the University Regents; Dr. Stratton D. Brooks, President of the University; Dr. Le Roy Long, Dean of the Medical Faculty; J. B. A. Robertson, Governor; Dr. A. R. Lewis, State Commissioner of Health; Dr. L. J. Moorman, President of the State Medical Association, and Jabez N. Jackson of Kansas City, who delivered the Dedicatory address. The invitation to the exercises recites the purpose of the institution as follows:

> The State University Hospital is established primarily to serve those citizens of Oklahoma who would otherwise be unable to secure satisfactory hospital service. On order of the County Commissioners, such patients are received at a nominal cost to the county. Owing to the connection of the hospital with the State University School of Medicine, excellent medical and surgical service is available free of cost.
>
> Persons of limited means will be admitted on certificate from their physician or from the county health officer on payment of cost of hospital service. Such patients receive medical and surgical service free of charge.
>
> A limited number of rooms are available for pay patients at standard rates.

and contains the following information as to capacity, etc:

> The State University Hospital contains 175 beds, of which 25 are in private rooms. There are five large sun porches which can be used for additional cases in emergencies. The eight wards include separate wards for men and for women, and for white people and for negroes. The five operating rooms include one for emergency use, one for eye, ear, nose and throat, and three for general surgery. There are ample laboratories for diagnostic purposes. In addition to the main kitchen there is a diet kitchen with a dietitian in charge on each floor. The x-ray room and equipment includes the latest improvements. The entire equipment of the hospital is absolutely the best and most modern that can be obtained. Every convenience for the treatment of special cases is available. The spacious roof garden will be serviceable in the treatment of certain types of cases. A wing of one of the floors has been set aside for teaching and for research laboratories.

A banquet for physicians and their guests was tendered at the Lee-Huckins Hotel at 7:00 p. m.

CORRESPONDENCE

Oklahoma City, Okla., Nov. 12, 1919.

Dr. Claude A. Thompson, Editor in Chief,
Journal of the Oklahoma State Medical Association,
Muskogee, Okla.

Dear Doctor:

I have read the editorial, "Overtraining the Nurse," Journal of the Oklahoma State Medical Association, Vol. XII, No. 10, pp. 295-6, October, 1919.

That editorial and any other article inviting remedial measures for the rapidly declining number of available nurses is most timely. I believe this is one of the most important problems confronting the Medical Profession today and, like yourself and other doctors, am anxious to learn the cause of this dearth of nurses and learn what means may remedy it.

The matter is of sufficient gravity to be thoroughly investigated by an organization with adequate

scope and means to perform such a task—the United States Public Health Service, the Rockefeller Foundation for Medical Research, or some similar body.

It is likely such an investigation would disclose many factors responsible for the shortage, and the cause and remedial measures necessary in one locality different from those in another.

Further than drawing attention and thought to the matter we will not get, by theorizing; especially when misleading and partial truths form the basis of our logic.

If it is true (which I much doubt) that "More than fifty thousand deaths occurred during the influenza epidemic which might have been prevented had fairly efficient nursing been available," the "well known Chicago practitioner" should present facts and figures substantiating his statement.

The second paragraph of your editorial suggests the necessity of careful collection of information to determine essential qualifications of the candidates in training and possibly a necessity for revision of entrance requirements, retention requirements, and requirements for graduation and practice, but such sweeping assertions as the following, without presentation of facts on which based, will not achieve the desired end: "Daughters of thousands of mechanics have been rejected from such schools because they have not been in position to obtain the one year preliminary but are otherwise qualified." I know that statement does not apply to the country in general. If such a condition exists locally it surely should be corrected and the correction would seem to be needed elsewhere than in the training schools.

No one has a greater affection for, or appreciation of, services rendered by the medical corps men of the U. S. A., than the writer; my opportunity of comparing their work with that of trained nurses has been as complete as most doctors and I cannot refrain from remarking, in the interest of medicine and on behalf of the wronged, that the insinuation in the last sentence of paragraph two of your editorial, that medical corps men rendered nursing service equal to that rendered by trained nurses in the recent war, is not in conformity with the facts.

With an institutional experience second to no man's in Oklahoma and experience equal to the large majority in work in patients' residences, I have observed the work under both conditions, of nurses real and alleged; those learned through experience only, those "graduated" after a six weeks training in a correspondence school, those graduated after six months intensive training in a hospital conducted by mediocre doctors, those who quit training after one or two years in a first-class school, and real graduate nurses.

Occasionally one finds an excellent nurse who had little or no scholastic training and I recollect two such who were illiterate, but those are rare exceptions.

As a group, the graduates of schools with a three year course of training; schools where training is actually given, are far superior to their less fortunate sisters and the patients who fall to their care fare best.

Speaking of what a physician requires of a nurse, a physician who "only requires his orders executed" is incompetent to practice medicine. He lacks a proper conception of his duty to his patient; he does not know the value of remedial measures such as dexterous handling of patient, bed and bedclothing and the many trivial activities of a nurse that are conducive to recovery, or the reverse, that go on continuously during the absence of a physician; he does not realize the necessity of a guard for his patient who is competent to quickly recognize critical changes and meet emergencies during his absence.

As a matter of fact, few physicians know how to make a bed and fewer know how to prepare articles of diet or give a bath, much less instruct a nurse how to do so, and it is therefore quite as essential to have thoroughly trained nurses as thoroughly trained chemists.

Let us refrain from correcting a deplorable condition by creating a worse.

Fraternally yours,

John A. Roddy,
612 American National Bank Bldg.

MISCELLANEOUS

ADROITNESS IS CORRECT.

Gentlemen who are engaged in the chiropractic trade—we use the word "trade" advisedly—are furnished Helpful Hints for Ambitious Advertisers by an Indianapolis concern that makes a specialty of this line. In one of the numerous leaflets sent out from this source to "Chiropractors" they are urged to "employ an advertising man," and not attempt to write their own copy. It is pointed out that there are in many states laws prohibiting fraudulent advertising, and "today the liar in print is soon run to earth." While we are unable, regretfully, to agree with the last statement, the conclusions drawn from this premise are more easily accepted:

". . . to advertise inside the chiropractic, medical and truth laws, requires some adroitness, some ingenuity of expression, some more than common ability as a wordsmith."

We'll say it does!—*Jour. A. M. A.*, Aug. 23, 1919.

INFLUENZA AFTER-EFFECTS.

F. C. Gram, Buffalo (*Journal A. M. A.*, Sept. 20, 1919), gives an account of the influenza epidemic of 1918 which struck Buffalo with the suddenness of a cyclone. The disease appeared October 1, with twenty-one reported cases. By October 14, they had the highest number reported in one day, namely, 1,886 cases with forty-eight deaths from influenza, seven from pneumonia and seven from bronchopneumonia. From that date on there was a gradual decline. It was a physical impossibility for physicians to see most of the patients more than once, hence many cases of pneumonia were reported only as influenza. It was only after the crest of the epidemic wave had passed that anything like accuracy in morbidity statics was possible. Gram gives an account of the measures taken by the health authorities; the prohibition of assemblages, etc., and the temporary increase of hospital facilities. "Our influenza was like a prairie fire—short and drastic. Every influenza patient was either convalescent or dead within five days from the onset of the attack." Exact knowledge is wanting as regards the sequels of the epidemic, and an after survey was undertaken, follow-up cards being distributed to every influenza victim under an appropriation by the city authorities. The field work occupied about two months, and the results are shown in tabulated form. On the first examination, 748 cases were found reporting after-effects—501 have since recovered, and 216 are reported as recovering. Four deaths have occurred, but whether they were due to the after-effects or not is hard to say. Only one death out of the four was caused by tuberculosis. There were 220 cases of respiratory disorders, and twenty-seven of these at least were tuberculosis. Out of the twenty-seven, eleven were already on their records as reported cases of tuberculosis before the influenza epidemic, and could not be charged to it. Only eight cases could be positively diagnosed. Several were in families with tuberculous records. The first important observatoin is the small number of sequelae as compared with the total number of influenza cases, and the high percentage of recovery. It seems definitely established that there is nothing to be feared as regards tuberculosis as a sequel. The results also show the value of the early and vigorous measures employed for prevention.

SPORTING NOTE.

"Nuxated Iron put added power behind my punch and helped to accomplish what I did at Toledo."—Jack Dempsey.

Thus the new world's champion, in large advertisements appearing in last Sunday's papers—at least in such papers as need the money from such sources. The secret is out. We feel that an apology is due to those of our readers who rely on this department for their knowledge of sporting events. We admit to a lack of enterprise in not discovering earlier what was going on behind the scenes in Mr. Dempsey's training camp. But three short years ago, Mr. Willard was telling the public—at the expense of the manufacturers of Nuxated Iron—that that marvelous "patent medicine" was the secret of his easy victories over Jack Johnson and Frank Moran. Now the Honorable William Harrison ("Jack") Dempsey—also at Nuxated Iron expense—"tells the secret" of his training and explains how "Nuxated Iron" helped him to whip Jess Willard! Ain't science wonderful!—*Jour. A. M. A.*, July 19, 1919.

RECURRENT EMPYEMA.

F. A. Stevens (Boston), Takoma Park, D. C. (*Journal A. M. A.*, Sept. 13, 1919), says that final results of operations for empyema can be ascertained only after a considerable period, varying in length according to the infection, the size and the shape of the cavity, and the treatment followed. The minimum of recurrences occurs when the sinus has been completely obliterated after treatment, and they are more frequent when a cavity containing air is left. If the Carrel-Dakin treatment is used to sterilize the cavity, the chances against recurrence are better. Two other possible causes of recurrence are mentioned, namely, isolated and undiscovered pus collections or sequestration of a part of the original cavity by contraction of its walls. Stevens has had the opportunity to complete the records of 123 cases, first observed at Camp Lee, Va., and later at General Hospital No. 12, at Biltmore, N. C. These fall into two groups, one of 100 treated by simple drainage, and the other twenty-three treated by preliminary aspiration until the first infection had subsided, and later by thoracotomy and use of a surgical solution of chlorinated soda. Forty-four of the first group were persistently and obstinately chronic until the Carrel-Dakin method was used. In only ten of these was the thoracoplasty of moderate extent finally indicated. Among the cases healed under simple drainage, there were recurrences within eight months in fourteen. Ten of them were due to the hemolytic streptococcus, the original infection. Among the cases healed under the Carrel-Dakin treatment there were eight recurrences. The efficacy of this treatment was shown by the higher percentage of the good results, and the group treated by this method showed that the pus pockets discovered were usually at some distance from the original focus. In these secondary foci there were two symptoms of value: (1) the failure to regain the normal weight or even the loss of weight, in spite of treatment, and (2) hte rapid pulse rate and the moderate fever that accompanied all cases of recurrence with pus secretion. These points are illustrated by two case reports. The details of the findings in these cases are given. Stereoscopic plates were usually necessary in diagnosing the condition. The treatment depended on the character of the fluid. When it was clear and sterile, aspiration was all that was needed. In all the cases of recurrence, with the exception of one, in which the cavity was completely evacuated at the first aspiration, all the purulent fluids were drained by thoracotomy. In many instances in which there were repeated recurrences at the original site, necrotic bone fragments were found, and there was required the greatest care, and the cooperation of surgeon, internist and roentgenologist.

GROWING OLD.

A little less anxious to have our way;
A little more tired at close of day;
A little less ready to scold and blame,
A little more care for a brother's name;
And so we are nearing the journey's end
Where time and eternity meet and blend.

A little less care for bonds and gold,
A little more zest in the days of old;
A broader view and a saner mind
And a little more love for all mankind;
And so we are faring a-down the way.

A little more love for the friends of youth,
A little less zeal for established truth;
A little more charity in our views,
A little less thirst for the daily news;
And so we are folding our tents away
And passing in silence at close of day.

A little more leisure to sit and dream,
A little more real the things unseen;
A little nearer to those ahead,
With visions of those long-loved and dead;
And so we are going to where all must go,
To the place the living may never know.

A little more laughter, a little more tears,
And we shall have told our increasing years;
The book is closed, and the prayers are said,
And we are a part of the countless dead.
Thrice happy, then, if some soul can say:
"I live because he has passed my way." —*New York Times.*

COUNCIL ON PHARMACY AND CHEMISTRY
AMERICAN MEDICAL ASSOCIATION

(The following articles produced by advertisers in this Journal have been accepted for inclusion with New and Non-Official Remedies by the Council on Pharmacy and Chemistry.)

Abbott Laboratories: Tablets Cinchophen-Abbott, 7½ grains.

Hynson, Westcott & Dunning: Acriflavine (Boots) Proflavine (Boots).

PROPAGANDA FOR REFORM.

Formaldehyde Tablets. During the recent influenza epidemic a variety of tablets or lozenges were advertised which were claimed to owe their asserted value to the fact that they contained formaldehyde and liberated it on contact with the saliva. Tablets containing hexamethylenamine or other formaldehyde compounds can neither cure respitartoy infection, nor even confer a protection against such infection. To be effective, formaldehyde would need to be supplied to the entire respiratory tract continuously for some time, or else in concentrations that would be distinctly irritant and damaging to the tissues. Some years ago, the Council reported on the inefficiency of Formamint, which was said to be an efficient germicide by virtue of the liberation of formaldehyde on contact with the saliva. To call attention to the inefficiency of this form of medication, the Council on Pharmacy and Chemistry now reports that the following were found inadmissible to New and Nonofficial Remedies: Hex-Iodin (Daggett and Miller Company, Inc.), Formotol Tablets (E. L. Patch Company) and Cin-U-Form Lozenges (McKesson and Robbins), (Jour. A. M. A., Oct. 4, 1919, p. 1077).

Solubility of Intestinal Ipecac Preparations. T. Sollman reports that in the administration of ipecac preparations against intestinal amebas, salol coated pills are not always satisfactory, although with due care, it appears quite feasible. He reports that emetin bismuth iodid, which is described in New and Nonofficial Remedies, is only slightly soluble in water and dilute acid, but dissolves quite freely in one per cent. sodium bicarbonate solution. It is somewhat soluble in the stomach and produces some digestive disturbances. Alcresta ipecac, an absorption of ipecac and fuller's earth, though sold with the claim that the alkaloids are "physiologically inert as long as they remain within the stomach,

and are rendered active when set free in the alkaline media of the intestine," was found by Sollmann not to be decomposed with liberation of alkaloid by solutions having the alkalinity of the intestinal fluid. Ordinarily, it would not be expected that a substance which is quite insoluble in the intestines should still be effective on amebas. The findings of Sollmann demand a careful examination of the clinical evidence on which the use of alcresta ipecac is based (Jour. A. M. A., Oct. 11, 1919, p. 1125).

The William A. Webster Company and the Direct Pharmaceutical Company. The Direct Pharmaceutical Company of St. Louis is apparently merely a sales agency for the William A. Webster Company, of Memphis, Tenn. In government bulletins issued in October, 1913, there were reported some cases of adulteration and misbranding on the part of the William A. Webster Company. In a similar bulletin issued in August, 1914, there were reported several more cases of adulteration and misbranding charged against the William A. Webster Company. In a government bulletin issued in June, 1917, the same company was charged with adulterating and misbranding Aspirin tablets (Jour. A. M. A., Oct. 18, 1919, p. 1231).

An Uncritical English Endorsement of Collosols. Under the auspices of the English Association for the Advancement of Science, there has appeared a report on the present status of colloidal chemistry. A chapter on the "Administration of Colloids in Disease" is devoted largely to the "Collosols" proprietary preparations made by the Crookes Laboratory. In it, the advertising "literature" of the Crookes concern appears to have been considered ample source of information. In the United States the medical profession has been informed by the Council on Pharmacy and Chemistry that a number of the "Collosol" preparations were not colloids at all and "if . . . injected intravenously as directed, death might result, making the physician morally if not legally liable." The Council also reported that in cases in which the therapeutic claims were examined, the claims were improbable or exaggerated and that "Collosol Cocaine" did not contain the claimed amount of cocaine (Jour. A. M. A., Oct. 18, 1919, p. 1218).

The Patenting of New Therapeutic Agents. Enterprising pharmaceutical manufacturers have usually been ready to appropriate the results of scientific research by investigators or therapeutic measures suggested by practicing physicians. Not infrequently, in such cases, the desire for financial gain has caused the marketing of such products with extravagant, if not false, claims as to their value. Therefore, though it is unethical for physicians to receive remuneration from patents on medicines or instruments, it is important that new therapeutic agents discovered in our research institutions be protected by patenting them and thus to so control them that they may be available without subordination to commercial interests. In 1914, the House of Delegates of the American Medical Association passed a resultion to the effect that the board of trustees of the Association should accept at its discretion a patent on a medicine or surgical instrument, as trustee, for the benefit of the profession and the public, provided that neither the Association nor the patentee should receive remuneration for this patent. The Rockefeller Institute for Medical Research has solved the problem in a similar manner. Certain products discovered there have been patented. It is proposed to permit the manufacture of such discoveries under license by suitable chemical firms and under conditions which will insure the quality of the drugs and their marketing at reasonable prices. It is further announced that the Institute will not receive any royalties or pecuniary benefits from the licenses it issues (Jour. A. M. A., Oct. 18, 1919, p. 1219).

Anasarcin Advertising. Dr. Louis Heitzman reports that charts and part of the text of a book by him is being used as advertising by the Anasarcin Company, and that his publishers think that, in spite of the violation of copyright, nothing can be done. Knowing the standards of ethics the Anasarcin Company adopts in the exploitation of its ridiculous squill mixture "Anasarcin," the appropriation of copyrighted material is not surprising. However, something *can* be done by those who hold the copyright (Jour. A. M. A., Oct. 18, 1919, p. 1232).

An Insidious Influence. A knock at the door. A gentleman with a grip full of samples and literature is ushered in. After a pleasant chat in which you are "informed" about the action of the particular remedies in which he is interested, he leaves you samples and departs. You turn to New and Nonofficial Remedies and find no mention of his remedy. Why? Because the Council on Pharmacy and Chemistry of our national organization has investigated the article and found sound reason why it should not be used by the profession, or else, the manufacturer did not deem it advisable even to submit the article (Minnesota Medicine, Sept. 1919, p. 355).

A Pharmaceutical Clearing House. The Council on Pharmacy and Chemistry of the American Medical Association is carrying on a work of great usefulness to doctor and layman. Actuated by no selfish interests, condemned by designing sharks who wish to exploit their frauds, and ridiculed by the jealous manufacturers of pharmaceuticals, the Council pursues the even tenor of its labors, playing no favorites, exposing frauds wherever found, and awaiting not the stamp of approval, of praise, or of gratitude from anyone. This "clearing house" is the medium through which physicians may learn the unvarnished, straightforward truths about proprietary products. A plea of ignorance of proprietary articles used does not excuse the physician, since it is his duty to follow the course of instruction offered by the Council and to appeal to this clearing house for information (Southern Medical Journal, Sept., 1919, p. 581).

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